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(54) Title: A CLEANING KIT AND A CLEANING COMPOSITION AND METHODS OF USE

(57) Abstract

A cleaning composition, a cleaning kit, and methods for using the composition and kit are disclosed. The cleaning composition comprises a first component comprising an enhancing amount of an enhancing agent to enhance the oxidising ability of an oxidising agent; together with a second component comprising an oxidising amount of the oxidising agent, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent.

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A Cleaning Kit and a Cleaning Composition and Methods of Use

Technical Field

This invention relates to a a cleaning composition, a cleaning kit, and methods for using the composition and kit as well as a stabilised oxidising agent in a solvent, and method of
5 preparing a stabilised oxidising agent in a solvent.

Background Art

Surfaces of articles are soiled and stained quite easily with dirt and grime due to their constant exposure to the environment. Furthermore surfaces are exposed to microorganisms which eventually cause slime and mould to appear on the surfaces. There
10 are many products on the market which are specific for cleaning and disinfecting surfaces however these products can not be used on all types of surfaces.

There is a need for a cleaning kit/composition to clean all types of surfaces and certain liquids.

Objects of the Invention

15 Objects of this invention are to provide a cleaning composition, a cleaning kit, and methods for using the composition and kit as well as a stabilised oxidising agent in a solvent, and method of preparing a stabilised oxidising agent in a solvent.

Disclosure of the Invention

Throughout the specification and claims the term "comprising" is to be taken as meaning
20 either "including", consisting essentially of" or "consisting of".

According to a broad form of this invention there is provided cleaning composition comprising a first component comprising an enhancing amount of an enhancing agent to enhance the oxidising ability of an oxidising agent; together with a second component comprising an oxidising amount of the oxidising agent, said oxidising agent being one
25 whose oxidising ability is capable of being enhanced by said enhancing agent.

Typically the cleaning composition further comprises a surfactant that is substantially stable in said cleaning composition and/or a stabilising agent to substantially stabilise the oxidising agent in said cleaning composition.

Typically free chlorine is not produced in the cleaning composition.

30 Typically the enhancing agent discourages the re-establishment of microorganisms on a surface or in a liquid cleaned with said cleaning composition.

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Generally the cleaning composition comprises a solvent selected from the group consisting of water and high purity water.

Typically the enhancing agent is an aqueous soluble alkaline earth metal halide salt and the oxidising agent is a peroxide compound and the enhancing agent is calcium chloride
5 and the oxidising agent is hydrogen peroxide.

Another form of the invention is a method of cleaning/treating a surface or an aqueous liquid comprising:

applying to the surface or to the aqueous liquid an effective cleaning/treating amount of the cleaning composition of the invention.

10 Another form of the invention is a method of killing a microorganism on a surface or in an aqueous liquid comprising:

applying to the surface or to the aqueous liquid an effective antimicrobial amount of the cleaning composition of the invention.

Another form of the invention is a method of cleaning/bleaching a surface selected from a
15 stained surface, a concrete surface, a brick surface, and a grout surface, said method comprising:

applying to the surface an effective cleaning/bleaching amount of the cleaning composition of the invention;

leaving the cleaning composition on the surface for a time sufficient to substantially
20 clean/bleach the surface.

Another form of the invention is a method of cleaning/treating a human or animal mouth, comprising:

an effective cleaning/treating amount of the cleaning composition of the invention.

Another form of the invention is a method of cleaning a water in a swimming pool
25 comprising:

applying to the swimming pool water an effective cleaning/treating amount of the cleaning composition of the invention.

Another form of the invention is a method of cleaning human or animal skin or treating human or animal skin requiring treatment for a preventable or treatable condition,
30 comprising:

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applying to the skin an effective cleaning/treating amount of the cleaning composition of the invention.

According to another embodiment of this invention there is provided a two-component cleaning kit comprising:

5 a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent; and

a second component comprising an oxidising agent, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent.

According to another embodiment of this invention there is provided a two-component
10 cleaning kit for cleaning a surface or an aqueous liquid comprising:

a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent applied to the surface or the aqueous liquid; and

a second component comprising an oxidising agent to oxidise organic matter on or in the surface or the aqueous liquid, said oxidising agent being one whose oxidising
15 ability is capable of being enhanced by said enhancing agent.

According to another embodiment of this invention there is provided a cleaning composition for cleaning a surface or an aqueous liquid comprising:

a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent applied to the surface or the aqueous liquid together with a second
20 component comprising an oxidising agent to oxidise organic matter on or in the surface or the aqueous liquid, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent.

Typically the cleaning composition is adapted to clean a surface or an aqueous liquid.

According to a further embodiment of this invention there is provided a one-component
25 cleaning kit for cleaning a surface or an aqueous liquid comprising a mixture of:

a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent applied to the surface or the aqueous liquid;

a surfactant that is substantially stable in an oxidising agent solution;

a second component comprising an oxidising agent to oxidise organic matter on or
30 in the surface or the aqueous liquid, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent; and

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a stabilising agent to stabilise the oxidising agent.

According to a further embodiment of this invention there is provided a method of cleaning/treating a surface or an aqueous liquid comprising:

applying to the surface or the aqueous liquid a first component comprising an
5 enhancing agent to enhance the oxidising ability of an oxidising agent applied to the surface;

applying to the surface or the aqueous liquid a second component comprising an oxidising agent to oxidise organic matter on or in the surface, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent; and

10 optionally mixing the first and second components prior to and/or after applying the first and second components to the surface or the aqueous liquid.

According to another embodiment of this invention there is provided a method of killing a microorganism on a surface or in an aqueous liquid comprising:

applying to the surface or the aqueous liquid a first component comprising an
15 enhancing agent to enhance the oxidising ability of an oxidising agent applied to the surface;

applying to the surface or the aqueous liquid a second component comprising an oxidising agent to oxidise and kill the microorganism on or in the surface, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing
20 agent; and

optionally mixing the first and second components prior to and/or after applying the first and second components to the surface or the aqueous liquid.

Generally the enhancing agent wets the surface.

The cleaning kit or cleaning composition of the invention may be exemplified in the
25 following way:

First Component	Second Component
Enhancing agent = A	Oxidising agent = B
Enhancing agent + a cleaning additive = A ₁	Oxidising agent = B
Enhancing agent + a mixture of cleaning additives = A ₂	Oxidising agent = B

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Enhancing agent = A	⁵ Oxidising agent + a cleaning additive = B ₁
Enhancing agent = A	Oxidising agent + a mixture of cleaning additives = B ₂
Enhancing agent + a cleaning additive = A ₁	Oxidising agent + a cleaning additive = B ₁
Enhancing agent + a cleaning additive = A ₁	Oxidising agent + a mixture of cleaning additives = B ₂
Enhancing agent + a mixture of cleaning additives = A ₂	Oxidising agent + a cleaning additive = B ₁
Enhancing agent + a mixture of cleaning additives = A ₂	Oxidising agent + a mixture of cleaning additives = B ₂

The first and second components are generally left on the surface for a time sufficient to effectively clean/treat the surface and/or kill microorganisms on the surface.

The methods of the invention may include:

rinsing the surface after the first and second components have been left on the surface for
5 a time sufficient to effectively clean the surface and/or kill microorganisms on the surface.

Typically the surface is rinsed with water or an aqueous based solution (which is typically in the temperature range 5-100°C).

Examples of the aqueous liquid include swimming pool water, water in a toilet bowl,
10 water in an aqueous based air conditioning system, water in a drain, bathwater, non drinking water and washing water, for example.

Alternatively, the cleaning additive or mixture of cleaning additives may be added separately to the cleaning kit/composition of the invention. The cleaning additive(s) is typically at least one of known additives that can be used in cleaning formulations.

15 The first component may be separate from the second component or as already mentioned the kit may be in the form of a composition comprising the first and second components. When the kit is in the form of a composition comprising the first and second components it optionally also includes a stabilising agent.

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Generally the first component is applied to the surface as a warm aqueous solution, typically 25-100°C, and the second component is applied to the surface when covered by the warm first component.

The first and second components may have a pH in the range of 0.5 to 10. To prepare a first component which is acidic, then an acid solution (for example, H_2SO_4 or HCl) or an acidic buffer may be added to the first component. To prepare a first component which is alkaline, then an alkaline solution (for example, sodium hydroxide, potassium hydroxide) or an alkaline buffer may be added to the second component. Similarly, the second component may be made acidic by the addition of an acid solution (for example, H_2SO_4 or HCl) or an acidic buffer. Alternatively, the second component may be made alkaline by the addition of an alkaline solution (for example, aqueous sodium hydroxide, aqueous potassium hydroxide) or an alkaline buffer.

Examples of the enhancing agent are calcium chloride, calcium acetate, calcium ascorbate, calcium borogluconate, calcium citrate, calcium formate, calcium gluconate, calcium nitrate, calcium methionate, calcium nitrite, calcium oxide, calcium propionate, calcium thioglycollate, calcium thiocyanate, calcium thiosulphate, calcium phosphate monobasic, calcium bisulphite, magnesium acetate, magnesium bisulphate, magnesium carbonate hydroxide, magnesium chloride, magnesium formate, magnesium potassium selenate, magnesium sulphate, magnesium benzoate, magnesium borate, magnesium citrate, magnesium citrate dibasic, magnesium lactate, magnesium mandelate, magnesium nitrate, magnesium oxalate, magnesium oxide, magnesium phosphate monobasic, magnesium salicylate, magnesium selenate, magnesium selenide, magnesium stannide, magnesium sulphite, magnesium thiocyanate, magnesium thiosulphate, magnesium sodium carbonate, sodium acetate, sodium aluminate, sodium ascorbate, sodium benzoate, sodium bicarbonate, sodium citrate, sodium phosphate monobasic, sodium tartrate, sodium chloride, sodium acid pyrophosphate, sodium bisulphate, sodium bisulphide, sodium bisulphite, sodium bitartrate, sodium borate, sodium borate solution compound, sodium borohydride, sodium diacetate, sodium dithionate, sodium ethoxide, sodium ethyl sulphate, sodium formaldehyde sulphonylate, sodium formate, sodium gluconate, sodium glycerophosphate, sodium hydrosulphite, sodium hydroxide, sodium hypophosphate, sodium lactate, sodium metabisulphite, sodium metaborate, sodium metasilicate, sodium methyl sulphate, sodium nitrate, sodium nitrite, sodium oxalate, sodium perborate,

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sodium phosphate dibasic, sodium phosphate tribasic, sodium propionate, sodium salicylate, sodium selenite, sodium sesquicarbonate, sodium stannate(IV), sodium stearate, sodium succinate, sodium sulphate, sodium sulphide, sodium sulphite, sodium tetradecyl sulphate, sodium tetrathionate, sodium thioglycolate, sodium thiophosphate, 5 potassium chloride, potassium acetate, potassium citrate, potassium ethyl sulphate, potassium gluconate, potassium nitrate, potassium sulphate, potassium zinc sulphate, potassium methyl sulphate, potassium aluminate, potassium p-aminobenzoate, potassium bicarbonate, potassium biselenite, potassium bisulphate, potassium bisulphide, potassium bitartrate, potassium borohydride, potassium borotartrate, potassium carbonate, potassium 10 formate, potassium glycerophosphate, potassium metabisulphite, potassium nitrite, potassium percarbonate, potassium persulphate, potassium phosphate dibasic, potassium phosphate monobasic, potassium phosphate tribasic, potassium phosphite, potassium pyrophosphate, potassium pyrosulphate, potassium salicylate, potassium selenate, potassium selenide, potassium silicate, potassium sodium tartrate, potassium sorbate, 15 potassium stannate(IV), potassium stearate, potassium sulphide, potassium sulphite, potassium sulphobenzoate, potassium tartrate, potassium tetraborate, potassium tetroxalate, potassium thiosulphate, potassium titanyl oxalate, zinc acetate, zinc chloride, zinc citrate, zinc formate, zinc lactate, zinc propionate, zinc salicylate, zinc selenate, zinc tartrate, ammonium chloride and alkaline earth metal salts which are typically aqueous 20 soluble (e.g. halide [fluoride, chloride, bromide, or iodide, typically chloride], nitrate, acetate, tartrate, sorbate, thiocyanate, borate, thiosulphate, citrate, stearate, ascorbate, salicylate, phosphate, pyrophosphate, pyrosulphate or sulphate) other than those mentioned above. The enhancing agent chosen may have properties such that it discourages the re-establishment of microorganisms (e.g. calcium chloride). Generally 25 the enhancing agent is used in the form of a solution, preferably an aqueous solution, typically in the range 0.1wt% to 70wt% or v%, more typically 1wt% to 50wt% or v%, based on the total weight of the solution. Typically amount of enhancing agent used is present in a range selected from the group consisting of a - b wt% (based on the weight of the first and/or second components or the kit or the composition) listed in Table X below. 30 The amount of enhancing agent used in the first component is 0.01 to 99wt% or v%, based on the total weight of the first component or the total weight of the composition. Preferably 0.1 to 75wt% or v%, more preferably 10 to 50wt% or v% enhancing agent is used in the first component. Typically the enhancing agent is an aqueous calcium

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chloride solution of 1 to 60wt% or v% calcium chloride. Typically the amount of calcium chloride used is present in a range selected from the group consisting of a - b (wt%) listed in Table X below where a is selected from the group consisting of a value presented in the column headed "a" in Table X below at one of entries 1-26, and b is selected from the group of the values presented in the column headed "b" adjacent the corresponding "a" entry. Typically the enhancing agent is an aqueous solution of calcium chloride in the range 1 to 10 wt%, more typically 1 to 7.9wt% based on the weight of the first component or the total weight of the first and second components or the total weight of the kit or composition. Typically up to 7.9wt% aqueous calcium chloride is used in the first component for non human/animal use and more typically 1 to 5%v/v and even more typically 1 to 3%v/v. Typically the aqueous enhancing agent solution is diluted by mixing the enhancing agent, preferably calcium chloride, with water having a typical temperature range of 15-100°C, preferably 25-95°C, 50-90°C, more preferably 60-80°C.

Typically the first component:second component are present in the kit/composition in a wt:wt or v:v or wt:v or v:wt ratio of between 1:20 to 20:1, advantageously 1:10 to 10:1, more typically 1:5 to 5:1 and even more typically 1:2 to 2:1 and yet even more typically 1:1.

The oxidising agent may be a peroxygenated compound comprising -O-O- therein, typically a peroxide, such as hydrogen peroxide, zinc peroxide, benzoyl peroxide, potassium peroxide, sodium perborate, potassium perborate, ammonium perborate, oxone (KHSO₅), sodium persulphate, sodium percarbonate, potassium percarbonate, ammonium percarbonate, ammonium persulphate, potassium persulphate, t-butyl hydroperoxide, magnesium monoperoxyphthalate, sodium peroxide, urea hydrogen peroxide, magnesium peroxide, calcium peroxide, organic hydroperoxides such as tert-butyl hydroperoxide, inorganic persalts other than above such as perborates, percarbonates and perphosphates of alkali metals or alkaline earth metals, for example or a mixture of any two or more of the foregoing. Generally the oxidising agent is used in the form of a solution, preferably an aqueous solution, typically in the range 0.1wt% to 70wt% (note wt% may be wt/wt% or wt/vol%) or 0.1v% to 70v% (note v% may be v% or v/wt%), more typically 1wt% to 50wt% or v%, based on the total weight or volume of the solution. Typically the solution is an aqueous solution and the oxidising agent is present in a range selected from the group consisting of a - b wt% or v% (based on the weight or volume of the first and/or

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second components or the kit or the composition) where a is selected from the group consisting of a value presented in the column headed "a" in Table X below at one of entries 1-26, and b is selected from the group of the values presented in the column headed "b" adjacent the corresponding "a" entry.

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Table X

Entry	a	b
1	0.1	1, 1.25, 1.5, 1.75, 2, 2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
2	0.5	1, 1.25, 1.5, 1.75, 2, 2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
3	0.75	1, 1.25, 1.5, 1.75, 2, 2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30

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4	1	1.25, 1.5, 1.75, 2, 2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
5	1.25	1.5, 1.75, 2, 2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
6	1.5	1.75, 2, 2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
7	1.75	2, 2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30

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8	2	2.25, 2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
9	2.25	2.5, 2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
10	2.5	2.75, 3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
11	2.75	3, 3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30

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12	3	3.25, 3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
13	3.25	3.5, 3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
14	3.5	3.75, 4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
15	3.75	4, 4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30

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16	4	4.25, 4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
17	4.25	4.5, 4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
18	4.5	4.75, 5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
19	4.75	5, 5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
20	5	5.25, 5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30

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21	5.25	5.5, 5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5
22	5.5	5.75, 6, 6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
23	6	6.25, 6.5, 6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
24	6.5	6.75, 7, 7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30
25	7	7.25, 7.5, 7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30

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26	7.5	7.75, 7.9, 8, 8.25, 8.5, 8.75, 9, 9.25, 9.5, 9.75, 10, 10.25, 10.5, 10.75, 11, 11.25, 11.5, 11.75, 12, 12.25, 12.5, 12.75, 13, 13.25, 13.5, 13.75, 14, 14.25, 14.5, 14.75, 15, 15.25, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20, 25, 30

Typically the amount of oxidising agent used in the second component is 0.01 to 99wt% or v%, preferably 0.1 to 50wt% or v%, more preferably 1 to 30wt%, even more preferably 2 to 30wt% or v%, based on the total weight of the second component. Preferably the oxidising agent is a peroxide, more preferably the oxidising agent is 5 hydrogen peroxide. Generally the peroxide is an aqueous solution of hydrogen peroxide in the range 1 to 20wt% or v%, more typically 2 to 15wt% or 1 to 7.9wt% or v% or is in a v% range or a wt% range as listed in Table X. Typically up to 20 wt% or v%, more typically up to 7.9wt% or v% aqueous hydrogen peroxide is used as the oxidising agent for non human/animal use and more typically 1 to 5%v/v and even more typically 1 to 10 3%v/v.

Generally the enhancing agent and oxidising agent are selected so that free chlorine is not produced when the enhancing and oxidising agents are mixed. Preferably free chlorine is not released because chlorine is a health risk plus it has a lingering smell and it permeates plastics.

15 A surface to be cleaned with the cleaning kit/composition of the invention may be even; uneven; untreated; or treated such as painted, coated with a resistant coating, coated with a non resistant coating, coated with an inhibitive coating or other like treatments. Examples of surfaces are basins, including kitchen and bathroom; kitchen, toilet and bathroom fittings including taps and faucets, toilets; bricks; quarry tiles; mortar; shading 20 mesh and other shading cloths; shower surfaces (for example tiles and fittings such as shower heads and taps); baths; other bathroom surfaces; bathroom tiles; contact lens, roof tiles, wall tiles, brewery floors, bars, basins, sinks, walls, benches, tables and other surfaces, hotel floors; walls, benches, bars, basins, sinks, tables and other surfaces, kitchen tiles; kitchen benches, kitchen sinks, toilet bowls, fibreglass surfaces, epoxy 25 surfaces, adhesive surfaces, painted surfaces, glass surfaces, perspex surfaces, polymer surfaces, rubber surfaces, metal surfaces, wire mesh, metal mesh, plastic mesh, lattice including wooden lattice, concrete floors and walls and other surfaces in abattoirs

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especially bloodied surfaces, ceiling surfaces, surfaces in drink and food preparation and service areas, laminated surfaces (eg Laminex , plastic and wooden laminates), in cooling towers including surfaces in cooling towers (in addition, oxidising agent/enhancing agent can be added to cooling tower liquid), wooden surfaces including wooden floors, benches, 5 walls and tables, metal surfaces, ceramic surfaces, concrete surfaces, fibreboard surfaces (eg particle board surfaces), cement surfaces, brick surfaces, plaster surfaces, gyprock surfaces, granite surfaces, marble surfaces, leather surfaces, fabric and textile surfaces including clothing (especially bleaching of blood on clothes and other textile objects (eg tents), fibreglass surfaces, plastic surfaces, porcelain tiles; slate tiles; ceramic tiles; 10 bathroom tiles; grout; concrete; concrete alkaline; cement for example Portland cement, white cement, oil well cement, regulated set cement, expansive cement such as Type K, Type M, Type S, blended cement such as a Pozzolan blended cement, calcium aluminate cement, supersulphated cement or hydraulic lime; granite; ceramic; glass; or other like surfaces. In the case of pulp and fabric and textile surfaces including clothing, for 15 example, it may be desirable to soak these items in an aqueous solution mixture of oxidising agent/enhancing agent for a time sufficient to clean/bleach them. The presence of enhancing agent in many instances reduces the amount of peroxide that would be required if the enhancing agent was not present. Many industrial bleaching and cleaning applications in which chlorine bleach is used can be replaced by the cleaning methods of 20 the invention.

The surface to be cleaned with the cleaning kit/composition of the invention may be even; uneven; untreated; or treated such as painted, coated with a resistant coating, coated with a non resistant coating, coated with an inhibitive coating or other like treatments. Examples of surfaces are basins, including kitchen and bathroom; kitchen, toilet and 25 bathroom fittings including taps and faucets, toilets; bricks; quarry tiles; mortar; shading mesh and other shading cloths; shower surfaces (for example tiles and fittings such as shower heads and taps); baths; other bathroom surfaces; bathroom tiles; roof tiles, wall tiles, brewery floors, bars, basins, sinks, walls, benches, tables and other surfaces, hotel floors, walls, benches, bars, basins, sinks, tables and other surfaces, kitchen tiles; kitchen 30 benches, kitchen sinks, toilet bowls, fibreglass surfaces, epoxy surfaces, adhesive surfaces, painted surfaces, glass surfaces, perspex surfaces, polymer surfaces, rubber surfaces, metal surfaces, wire mesh, metal mesh, plastic mesh, lattice including wooden

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lattice, concrete floors and walls and other surfaces in abattoirs especially bloodied surfaces, ceiling surfaces, surfaces in drink and food preparation and service areas, laminated surfaces (eg Laminex , plastic and wooden laminates), in cooling towers including surfaces in cooling towers (in addition, oxidising agent/enhancing agent can be 5 added to cooling tower liquid), wooden surfaces including wooden floors, benches, walls and tables, metal surfaces, ceramic surfaces, concrete surfaces, fibreboard surfaces (eg particle board surfaces), cement surfaces, brick surfaces, plaster surfaces, gyprock surfaces, granite surfaces, marble surfaces, leather surfaces, fabric and textile surfaces including clothing (especially bleaching of blood on clothes and other textile objects (eg 10 tents), filaments or yarns, such as wheat, flax, or inedible vegetable clumps, strands, filaments or yarns, such as wood pulp or cotton, animal clumps, strands, filaments or yarns, such as meat, alpaca, wool fibres such as wool fibres from sheep or other wool producing animals, hairs, such as human hairs, goat hairs, cattle hairs, or feathers, yarns including wool and cotton yarns, (especially dyed wool, rabbit hair, kangaroo fur, mohair 15 and cotton yarns as well as staples), string, fibreglass surfaces, plastic surfaces, porcelain tiles; slate tiles; ceramic tiles; bathroom tiles; grout; concrete; concrete alkaline; cement for example Portland cement, white cement, oil well cement, regulated set cement, expansive cement such as Type K, Type M, Type S, blended cement such as a Pozzolan blended cement, calcium aluminate cement, supersulphated cement or hydraulic lime; 20 granite; ceramic; glass; or other like surfaces. In the case of pulp and fabric and textile surfaces including clothing, for example, it may be desirable to soak these items in an aqueous solution mixture of oxidising agent/enhancing agent for a time sufficient to clean/bleach them. The presence of enhancing agent in many instances reduces the amount of peroxide that would be required if the enhancing agent was not present. Many 25 industrial bleaching and cleaning applications in which chlorine bleach is used can be replaced by the cleaning methods of the invention.

Alternatively, the surface may be human, or animal tissue or other human or animal material, including skin (including inner skin in the inside of the human or animal's mouth, or outer skin), hair, coat, eye, nails, ears, teeth, and in the case of dead animals, 30 the flesh, skin and coat of a dead animal. Typically the animal is a mammal or vertebrate such as, bird, fish or reptile. Advantageously the mammal or vertebrate is a bovine, human, ovine, equine, ape, caprine, Leporine, domestic fowl, feline or canine vertebrate.

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More typically, the vertebrate is selected from the group consisting of sheep, cattle, deer, buffaloes, swine, pigs, ducks, chickens and goats.

The surface may be the surface of human tissue or other human material, and then the kit/composition typically comprises a food, pharmaceutically or cosmetically acceptable composition(s) which includes at least one food, pharmaceutically or cosmetically acceptable carrier, adjuvant and/or excipient. Where, the surface is the surface of animal tissue or other animal material, the kit/composition typically comprises food or veterinarianilly acceptable composition(s) which includes at least one food or veterinarianilly acceptable carrier, adjuvant and/or excipient.

10 For oral (such as a mouth wash) and other invasive administration, and topical administration, the food, pharmaceutical or veterinary composition(s) may be in the form of elixirs(s), solution(s), gel(s), suspension(s), emulsion(s), syrup(s) or tincture(s), for example. For oral administration the compositions may contain food, pharmaceutically or veterinarianilly acceptable sweeteners, diluents, flavourings, and preservatives and other
15 suitable additives. Suitable sweeteners include sucrose, lactose, glucose, aspartame or saccharine. Suitable flavouring agents include peppermint oil, oil of wintergreen, cherry, orange or raspberry flavouring. Suitable preservatives include sodium benzoate, vitamin E, alpha-tocopherol, ascorbic acid, methyl paraben, propyl paraben or sodium bisulphite. Typically, the carrier or carriers will form from 5% to 99.9% by weight of the
20 composition. Oral and other invasive kits such as kits for gargles, mouthwashes, nasal washes, douches, enematas, ear washes, etc are typical forms of the invention. Oral kits such as gargles and mouthwashes are particularly useful for the treatment of bad breath, gum disease and gum infections, cold sores, gingivitis, moniliasis, mouth ulcers, mouth cuts and mouth lesions, as well as for cleaning and whitening teeth and removing food
25 from gum and teeth.

For topical administration, the food, pharmaceutical, cosmetic or veterinary composition may be in the form of a gel(s), jelly(ies), tincture(s), lotion(s), solution(s), suspension(s) or emulsion(s), or pour-on formulation(s), for example. The food, pharmaceutical and veterinary composition(s) may contain food or pharmaceutically acceptable binders,
30 diluents, disintegrating agents, preservatives, lubricants, dispersing agents, suspending agents and/or emulsifying agents as exemplified above. The veterinary composition may contain veterinarianilly acceptable binders, diluents, disintegrating agents, preservatives,

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lubricants, dispersing agents, suspending agents and/or emulsifying agents as exemplified above. Topical kits for the treatment or prevention on humans and animals of psoriasis, hair rinse, bed sores, cradle cap, hyperkeratosis, xeroderma, skin cuts, ulcers, sores, microbial and fungal skin infections including scalp and foot infections, onychia, 5 paronychia, pruritis, haemorrhoids, nappy rash, keratosis, ichthyosis, lichen planus, boils (especially spent boils), skin wounds, nail infections, pediculoses, scabies, dead skin, conjunctivitis, scaling, seborrhoea including seborrheic dermatitis, skin necrosis, atopic dermatitis, contact dermatitis, urticaria, acne including acne vulgaris, eczema, dermatitis, impetigo, intertrigo, infestations, mycotic infections including tinea capitis, flyblown 10 skin, tinea corporis, tinea cruris, tinea pedis (athlete's foot), and tinea unguium.

Compositions of the invention human or animal tissue or other human or animal material, may be prepared by any suitable means known in the relevant art for the preparation of compositions (such as in the art of preparing food, veterinary, cosmetic and pharmaceutical compositions) including homogenising, suspending, dissolving, 15 emulsifying, dispersing and mixing of the enhancing agent and/or oxidising agent together with the selected excipient(s), carrier(s), adjuvant(s) and/or diluent(s). Aqueous solutions or suspensions may further comprise one or more buffering agents. Suitable buffering agents include sodium acetate, sodium citrate, sodium borate or sodium tartrate, for example.

20 Liquid forms for oral and other invasive administration, or topical administration may contain, in addition to the above agents, a liquid carrier in addition to or in place of, in some instances, water. Illustrative of food, pharmaceutically, veterinarily or cosmetically (for external use) acceptable carriers or diluents include lower alkanols, demineralized or distilled water; saline solution; for example ethanol, propanol, isopropanol, Ringer's 25 solution, isotonic salt solution, 5% dextrose in water, buffered sodium or ammonium acetate solution, 1,3-butanediol, propylene glycol, polyethylene glycols acetone or mixtures thereof.

A suitable treatment may comprise the administration of multiple doses (or a single dose). Usually, the treatment will consist of simultaneously administering from one to five doses 30 daily of the first and second components for a period sufficient to clean the surface the microorganism (which will vary depending on the patient, type of organic matter, microorganism or fungus - e.g. 7 days - 27 days, typically 10 days - 21 days), and then

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used from time to time thereafter (e.g. once a day or once every three days or once a week, for example).

The cleaning kit/composition of the invention may comprise one or more known cleaning agents/additives such as a surfactant, an antimicrobial agent; enzyme(s); an antifungal agent; a lubricant; a preservative; a water softener; a colorant; a propellant (for aerosols); a perfume or fragrance; a defoamer; detergent builder; a disinfectant and/or a sanitiser; a surface-active agent; dispersing agent; or a thickener or gelling agent. The amount of additive typically used in the cleaning kit/composition of the invention is 0.01 to 90wt% or v%, more typically 0.1 to 15wt% or v%, even more typically 0.5 to 10wt% or v%, and even more typically 0.5 to 5wt% or v%, based on the total weight or volume of the cleaning kit/composition. Typically, the additive(s) is/are in the form of a solution, preferably an aqueous solution. The additive(s) may be added to the cleaning kit/composition of the invention as a separate component. Alternatively, the additive(s) may be added to the first component and/or the second component.

15 Examples of surfactants are nonionic, cationic, anionic or amphoteric surfactants especially those that are compatible with, i.e. are not oxidised by, the oxidising agent. Mixtures of surfactants may be used but some surfactants are incompatible, such as anionic and cationic surfactants.

Examples of non-ionic surfactants are fatty acid esters of polyoxyethylene sorbitan such as polyoxyethylene sorbitan trioleate; tributylphenoxypolyethyleneethanol; polyglycol ether derivatives of aliphatic or cycloaliphatic alcohols having approximately 3 to 30 glycol ether groups and approximately 8 to 20 carbon atoms in the (aliphatic) hydrocarbon moiety; saturated or unsaturated fatty acids and alkylphenols having approximately 6 to 18 carbon atoms in the alkyl moiety of the alkylphenols; water-soluble adducts of polyethylene oxide with ethylenediaminopolypropylene glycol, polypropylene glycol, or alkylpolypropylene glycol having approximately 1 to 10 carbon atoms in the alkyl chain, having approximately 20 to 250 ethylene glycol ether groups and approximately 10 to 100 propylene glycol ether groups in the usual ratio of 1 to 5 ethylene glycol moiety: propylene glycol moiety; octylphenoxypolyethoxyethanol; polyethylene glycol; polypropylene/polyethylene oxide adducts; castor oil polyglycol ethers; nonylphenolpolyethoxyethanols; fluorosurfactants, for example, perfluoroalkane carboxylic or sulphonic acids, such as ammonium or potassium salts thereof, or Merpel A

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(a registered trade mark of Du Pont and obtainable from Du Pont, 1007 Market Street, Wilmington, DE 19898, United States of America). Mergal A is an example of a surfactant that is substantially stable in an oxidising agent solution.

Examples of cationic surfactants are quaternary ammonium salts in the form of halides, 5 methylsulphates or ethylsulphates which have as N-substituent at least one C₈-C₂₂ alkyl radical or unsubstituted or benzyl or hydroxy-lower alkyl radicals such as stearyltrimethyl ammonium chloride.

Examples of anionic surfactants are water-soluble soaps or water-soluble synthetic surface active compounds. Examples of the soaps are alkali metal salts, alkaline earth metal salts, 10 unsubstituted or substituted ammonium salts of higher fatty acids (C₁₀-C₂₂), such as the sodium or potassium salts of linoleic acid, palmitic, abietic or stearic acid or of natural fatty acid mixtures such as coconut oil or tallow oil, or fatty acid methylaurin salts. Examples of synthetic surfactants are sulphonated benzimidazole derivatives, alkylarylsulphonates, fatty alcohol sulphonates, or fatty alcohol sulphates.

15 Examples of sulphonated benzimidazole derivatives are 2 sulphonic acid groups and one fatty acid radical containing approximately 8 to 22 carbon atoms. Examples of alkylarylsulphonates are the sodium calcium, or triethanolamine salts of dodecylbenzenesulphonic acid, dibutyl-naphthalenesulphonic acid, of a condensate of naphthalenesulphonic acid and formaldehyde or the phosphate salt of the phosphoric acid 20 ester of an adduct of p-nonylphenol with 4 to 14 moles of ethylene oxide. Examples of fatty alcohol sulphates or sulphonates are unsubstituted or substituted ammonium salts such as C₈-C₂₂ alkyl radical including the alkyl moiety of acyl radicals such as the calcium or sodium salt of lignosulphonic acid, of a mixture of fatty alcohol sulphates from naturally occurring fatty acids, of dodecylsulphate, alkaline earth metal salts or alkali 25 metal salts or the salts of sulphated and sulphonated fatty alcohol/ethylene oxide adducts.

Examples of amphoteric surfactants are the aminocarboxylic and aminosulphonic acids and salts thereof such as alkyl and alkylamido betaines such as cocamidopropyl betaine; alkali metal 3-(dodecylamino)propionate and alkali metal 3-(dodecylamino)propane-1-sulphonate; higher fatty alkanolamides having approximately 12 to 16 carbon atoms in the 30 acyl group which is reacted with a lower (1 to 3 carbon atoms) mono- or dialkanolamine such as lauric monoethanolamide or cocodiethanolamide.

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Further examples of surfactants are described in "Encyclopedia of Chemical Technology", Kirk Othmer, 3rd edition, Volume 8, John Wiley & Sons 1982, "Handbook of Surfactants", M.R. Porter, Blackie (Glasgow and London), Chapman and Hall (USA) 1991, "Encyclopedia of Surfactants", compiled by Michael and Irene Ash, Volumes I-III, 5 Chemical Publishing Co. 1980-1981, "Encyclopedia of Surfactants", compiled by Michael and Irene Ash, Volume IV, Chemical Publishing Co. 1985, "Emulsifying Agents An Industrial Guide", Ernest W. Flick, Noyes Publications 1990, "What Every Chemical Technologist Wants To Know About... Volume IV Conditioners, Emollients and Lubricants", compiled by Michael and Irene Ash, Edward Arnold 1990, "McCutcheon's 10 Detergents and Emulsifiers Annual", MC Publishing Corp., Glen Rock, NJ, USA, 1988 and "Tensid-Taschenbuch", H. Stache, 2nd edition, C. Hanser Verlag, Munich, Vienna, 1981, the contents of which are incorporated herein by cross reference.

The amount of surfactant used in the cleaning kit/composition of the invention is typically 0.01 to 90wt% or v%, based on the total weight or volume of the cleaning kit or cleaning 15 composition, more typically 0.1 to 50wt%, more typically 0.1 to 10wt% or v% is used in the cleaning kit/composition. Typically the amount of surfactant used is present in a range selected from the group consisting of a - b (wt% or v%) listed in Table X below where a is selected from the group consisting of a value presented in the column headed "a" in Table X below at one of entries 1-26, and b is selected from the group of the values 20 presented in the column headed "b" adjacent the corresponding "a" entry. Typically the surfactant is used in the form of a solution, preferably an aqueous solution. Preferably the surfactant is mixed with the first component or is included in the whole of the cleaning composition. Typically a non ionic surfactant is used as the surfactant in the cleaning kit/composition. Usually the nonionic surfactant is a fluorosurfactant such as Merpol A (a 25 registered trade mark of Du Pont and obtainable from Du Pont, 1007 Market Street, Wilmington, DE 19898, United States of America). Preferably the amount of Merpol A used in the cleaning kit/composition of the invention is 0.1wt% or v%, based on the total weight or volume of the cleaning kit/composition.

Examples of antimicrobial agents are potassium permanganate, potassium dichromate, 30 cobaltous sulphate, zinc sulphate, silver, silver nitrate, strongly acidic pH, strongly alkaline pH, 1-phenoxyphenyl-1-triazolylmethyl-carbinols, manganous sulphate, silver

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oxide, colloidal silver iodide, phenol, paraben, chlorobutamol, sorbic acid, Quat 50 or mixtures thereof.

Examples of preservatives are sodium benzoate, glycerine, formalin, or lower carboxylic acids. Preferably an additive is added to facilitate uptake of the preservative. The usual
5 additives are acetone, dioxane, glyme, diglyme, triglyme, or 1-methyl-2-pyrrolidone. The additives are generally water soluble/miscible solvents and further examples may be found below.

Examples of water softeners are polyphosphates such as sodium tripolyphosphate or sodium hexametaphosphate; aminocarboxylic acids such as ethylenediaminetetraacetic
10 acid; 1,3-diketones such as acetylacetone; hydroxycarboxylic acids such as citric acid, tartaric acid or gluconic acid; polyamines such as ethylenediamine; amino alcohols such as triethanolamine.

Examples of perfumes or fragrances are naturally occurring oils for example lemon grass oil, clove leaf oil, ambergris, bergamot oil, benzoin oil, castoreum, civet, eucalyptus,
15 geranium oil, jasmine absolute, lavender, myrrh, musk tonquin, mimosa, rose oil, rosemary oil, or sandalwood oil or synthetic aroma chemicals for example citronellol, benzyl acetate, geraniol, linalool, musk ambrette, or terpinyl acetate. Further examples of perfumes or fragrances are described in "The Perfume Handbook", Nigel Groom, 1st edition, Chapman & Hall 1992, the contents of which are incorporated herein by cross
20 reference.

Generally defoamers control foam formation. Examples of defoamers are fatty amides, fatty acid soaps, fatty alcohols, ethoxylates, or other like defoamers.

Examples of detergent builders are condensed phosphates, trisodium nitrilotriacetate, polymaleates, polymethacrylates, polyacrylates or other like detergent builders.

25 Examples of disinfectants and/or sanitisers include aliphatic alcohols such as ethyl alcohol, N-chloramines such as sodium N-chloro-p-toluenesulphonamide, N,N-dichloro-p-toluenesulphonamide, N,N-dichloro-p-carboxybenzenesulphonamide, iodine and organic iodine compounds, and other like disinfectants and/or sanitisers.

A surface-active agent is generally a surfactant and examples of surfactants are found
30 above.

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Examples of dispersing agents are condensed phosphates; or organic polymers such as organic phosphonates, polyphosphates, polyacrylates, sulphonated polymers, polymethacrylates, polymaleates.

In some cases it may be necessary to add a thickener to increase the viscosity, in order to provide a more stable emulsion. Examples of thickeners or gelling agents are soap gels, gums, such as Xanthan gum or Guar gum, starches such as furcellaran, hypnean, dextran, or tamarind, proteins, alginates, pectic gels such as sodium pectate, alkylcellulose hydrophilic colloids, for example, hydroxypropylmethyl cellulose, sodium carboxymethyl cellulose, hydroxymethylcellulose, ethyl succinylated Cellulose, succinylated zein, or carboxymethylcellulose, polymers such as sodium poly (styrene sulphonate) with poly (vinyl methyl pyridinium) chloride, sodium poly (styrene sulphonate) with poly (vinyl benzyl trimethyl ammonium) chloride, strongly acidic polyanion with strongly basic polycation, vinyl acetate homopolymer, polyvinyl alcohol resin, or carboxypolymethylene (a carboxyvinyl polymer or a polyacrylic acid polymer), bentonite and mixtures thereof or other like thickeners. Other examples of thickeners or gelling agents are aluminium mono-, di-, and tristearates, aluminium palmitate, aluminium octanoate, magnesium aluminium silicate, and sodium fluorosilicate. It may, in some instances, be desirable to use various thickeners or gelling agents in the first and/or second component either as a mixture or in layers. Thickeners or gelling agents which have been found to be useful for such purposes include sodium alginate, potassium alginate, polygalacturonic acid and a mixture of gelatin and sodium alginate. Other suitable thickeners or gelling agents include, but are not limited to, alginate with gelatin.

If a thickener or gelling agent has been chosen, there are numerous parameters which influence the character of the gel matrix. A sodium alginate solution, for example, will form a gel when a complexing agent is added. Calcium salts such as calcium nitrate and calcium hydroxide are useful complexing agents. Copper salts (particularly copper sulphate), chitosan (a deacylated chitin), potassium chloride, ammonium chloride, lanthanum chloride, ferric chloride, cobaltous chloride, sodium tetraborate, and other compounds generally with multivalent cations also are useful complexing agents.

The cleaning kit/composition of the invention may further comprise a corrosion inhibitor (which may be included in Part A or Part B or both Part A and Part B or the combined Part A/Part B composition). Generally the corrosion inhibitor may be selected from

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inorganic inhibitors, organic inhibitors or vapour-phase inhibitors. Inorganic inhibitors may be classified as functioning with or without oxygen. Examples of inhibitors functioning without oxygen include chromate and nitrate, examples of inhibitors requiring oxygen include sodium phosphates and borates. Examples of inorganic inhibitors include

5 citric acid, sodium citrate, sodium nitrate, ammonia and the like. Examples of organic inhibitors include aniline, amino-polyphosphonates including nitrilotris phosphate ($\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_3$), the Dequest range generally, and, in particular, including Dequest 2000, Dequest 2010, 2016D, 2041, 2046, 2054, 2060S, 2066 or Dequest 2006; the Briquest range generally including **BRIQUEST** 221-60A, (2-

10 Hydroxyethyliminobis(methylenephosphonic), $\text{HOCH}_2\text{CH}_2\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_2$, **BRIQUEST** 231-A, iso-Propyliminobis-(methylenephosphonic), $\text{i-PrN}(\text{CH}_2\text{PO}_3\text{H}_2)_2$, **BRIQUEST** 2N31-A, n-Propyliminobis-(methylenephosphonic), $\text{n-PrN}(\text{CH}_2\text{PO}_3\text{H}_2)_2$, **BRIQUEST** 2N41-A, n-Butyliminobis-(methylenephosphonic), $\text{n-BuN}(\text{CH}_2\text{PO}_3\text{H}_2)_2$, **BRIQUEST** 2N61-A, n-Hexyliminobis-(methylenephosphonic), $\text{n-HexylN}(\text{CH}_2\text{PO}_3\text{H}_2)_2$, **BRIQUEST**

15 2N71-A, n-Heptyliminobis(methylenephosphonic), $\text{n-HeptylN}(\text{CH}_2\text{PO}_3\text{H}_2)_2$, **BRIQUEST** 281-A, (2-Ethylhexyl) iminobis-(methylenephosphonic), $(2\text{-Ethylhexyl})\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_2$, **BRIQUEST** 2N81-A, n-Octyliminobis-(methylenephosphonic), $\text{n-octylN}(\text{CH}_2\text{PO}_3\text{H}_2)_2$, **BRIQUEST** 291-A, iso-Nonyliminobis-(methylenephosphonic), iso-nonylN($\text{CH}_2\text{PO}_3\text{H}_2$)₂, **BRIQUEST** 2121-A, Dodecyliminobis-(methylenephosphonic),

20 dodecylN($\text{CH}_2\text{PO}_3\text{H}_2$)₂, **BRIQUEST** ADPA-60A, 1-Hydroxyethane-1,1-diphosphonic, $\text{CH}_3\text{C}(\text{OH})(\text{PO}_3\text{H}_2)_2$, **BRIQUEST** 301-50A, Nitrilotris-(methylenephosphonic), $\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_3$, **BRIQUEST** 422-100A, Ethylenediaminetetrakis-(methylenephosphonic), $[\text{CH}_2\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_2]_2$, **BRIQUEST** 462-A, Hexamethylenediaminetetrakis-(methylenephosphonic), $[\text{C}_3\text{H}_6\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_2]_2$,

25 **BRIQUEST** 543-45AS, Diethylenetriamine- pentakis (methylenephosphonic), $\text{H}_2\text{O}_3\text{PCH}_2\text{N}[\text{C}_2\text{H}_4\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_2]_2$, **BRIQUEST** 664-A, Triethylenetetramine- hexakis (methylenephosphonic), $\text{C}_{12}\text{H}_{36}\text{N}_4\text{O}_{18}\text{P}_6$, **BRIQUEST** 785-A, Tetraethylenepentamine- heptakis (methylenephosphonic), $\text{C}_{15}\text{H}_{44}\text{N}_5\text{O}_{21}\text{P}_7$, **BRIQUEST** 8106-A, Pentaethylenhexamine- octakis (methylenephosphonic), $\text{C}_{18}\text{H}_{52}\text{N}_6\text{O}_{24}\text{P}_8$, as well as the

30 sodium, potassium and ammonium salts of all these acids, aminophosphonate acids such as ethylene diamine tetra(methylene phosphonic acid), aminotri(methylene phosphonic acid), diethylenetriamine penta(methylene phosphonic acid), 1-hydroxy ethylidene (1,1-diphosphonic acid), ethylene diamine tetra (methylene phosphonic acid), hexamethylene

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diamine tetra (methylene phosphonic acid), diethylene triamine penta (methylene phosphonic acid), as well as the sodium, potassium and ammonium salts of all these acids, substituted anilines, 2-phosphonobutane-1,2,4-tricarboxylic acid, nitrilotrimethylenephosphonic acid, 1-hydroxyethylidene-1,1'-diphosphonic acid, 1,1'-5 diphosphonoethane-2-carboxylic acid, 1-hydroxy-1-phosphonopropane-1,2,3-tricarboxylic acid, catechol-3,5-disulfonic acid, sodium pyrophosphate, sodium tetrapolyphosphate, phosphonate acids such as 1-hydroxy ethylidene-1,1-diphosphonic acid, 2-phosphono acetic acid, 2-phosphono propionic acid, and 1-phosphono ethane 1,2-dicarboxylic acid, sodium hexametaphosphate, aminopolycarboxylic acids, including the salts thereof, N-10 hydroxyethyl aminodiacetic acid and the poly-aminocarboxylic acids including N-hydroxyethylethylenediaminetriacetic acid, diethylenetriaminepentaacetic acid, cyclohexene diamine tetraacetic acid, triethylene tetraamine hexa-acetic acid and salts thereof and the like; pyridine, butylamine, benzoic acid, substituted benzoic acids, benzenesulphonic acid, petroleum sulphonates, phosphate esters, glycerol esters, glycine, 15 butynediol, glucose, lactose, diethanolamine condensates, monoalkanolamine condensates, aliphatic acid, petroleum sulphonates, phosphate esters, glycerol esters, mono-, di-, and polyamines derived from fatty and rosin acids, amine ethoxylates, 2-alkyl-1-(2-hydroxyethyl)-2-imidazolinesamide amines, tolyltriazole, butyndiol, glycine, nonamethyleneimine, quinoline, substituted quinolines, thiourea, dihexylamine, 20 tolualdehyde, diphenylurea, carbon disulphide, allylthiourea, octadecylamine, hexadecylamine, poly-hydroxy stabilising agents such as a saccharide, including monosaccharides such as glucose, fructose, mannose, idose, galactose, allose, arabinose, gulose, fucose, erythrose, threose, ribose, xylose, lyxose, altrose, mannose, idose, talose, erythrulose, ribulose, xylulose, psicose, sorbose, tagatose, glucuronic acid, glucaric acid, 25 gluconic acid, galacturonic acid, manuronic acid, glucosamine, galactosamine and neuraminic acid, disaccharides such as sucrose, maltose, cellobiose, lactose, and trehalose, and polysaccharides such as a small starch molecules, as well as homo or heteropolymers thereof, a polyhydric alcohol, such as $-\text{CH}_2-\text{CHOH}-\text{CH}_2\text{OH}$, $-\text{CH}_2-(\text{CHOH})_2-\text{CH}_2\text{OH}$, $-\text{CH}_2-(\text{CHOH})_3-\text{CH}_2-\text{OH}$, $-\text{CH}_2-(\text{CHOH})_4-\text{CH}_2\text{OH}$, or mannitol, 30 sorbitol, glycidol, inositol, pentaerythritol, galacitol, adonitol, xylitol, alabitol, or stabilising agents such as polyethylene glycol, propylene glycol monostearate, propylene glycol distearate, ethylene glycol monostearate, diglycerol, ethylene glycol distearate, ammonium lauryl stearate, monothioglycerol, mono-, di and tri-glycerides, diethylene

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glycol, hexamethylene glycol, cyclohexamethylenediol, 1,1,1-trimethylolpropane, pentaerythritol, urea, butylene glycol, dibutylene glycol, hexylene glycol, 1,3 propane diol, 1,4 butane diol, 1,3 butane diol, 1,4 cyclohexane dimethanol, 1,3 cyclopentane dimethanol, 2,3 butane diol, 1,2-cyclopentane diol, 1,2-cyclohexane diol, pinacol, 2-5 butoxyethanol, ethylene glycol monomethyl ether, diethylene glycol monomethyl ether, triethylene glycol, tripropylene glycol, ethylene glycol, benzyl benzoate, dioxolanes, glycerine formals, thiosorbital, tetrahydrofurfuryl alcohol, C₁-C₁₂ alcohols including monohydric aliphatic alcohols having 1 to 6 carbon atoms such as ethyl alcohol, isopropyl alcohol and hexanol, glycol ethers, 2-methoxyethanol, 2-butoxyethanol, 5-ethoxy-1-10 pentanol, diethyleneglycol monoethyl ether, propylene glycol, dipropylene glycol, tripropylene glycol, triols, polyols, lactates, glycerin, lecithin, polyoxyethylene sorbitan monoleate, sorbiton monoleate and albumin. Vapour-phase inhibitors are usually volatile compounds containing one or more functional groups capable of inhibiting corrosion. Examples of these inhibitors include amine salts with nitrous or chromic acids; amine salts 15 with carbonic, carbamic, acetic, or substituted or unsubstituted benzoic acids; organic esters of nitrous, phthalic, or carbonic acids; primary, secondary, or tertiary aliphatic amines; cycloaliphatic and aromatic amines; polymethylene amines; mixtures of nitrites with urea, urotropine, and ethanolamine; nitrobenzene and 1-nitronaphthalene. Preferred corrosion inhibitors include nitrilotris phosphate, the Briquest range generally, the 20 Dequest range generally, and in particular, Dequest 2000, 2010 or 2006, sodium gluconate, benzotriazole, or mixtures thereof. Some corrosion inhibitors may also act as stabilising agents. Typically a mixture of corrosive inhibitors is used. Typically the corrosion inhibitor is included in the solution of the first and/or second component or in the cleaning composition in an amount of 0.03 - 15wt% or v%, 0.05 - 10wt% or v%, 25 more typically 0.1 - 5wt% or v% and even more typically 1 - 5wt% or v% and yet even more typically 1 - 3wt% or v% based on the total wt or v of the first and/or second component or the wt or v of the total composition. Typically the amount of corrosion inhibitor used in the cleaning kit/composition of the invention is 0.1-8 wt% or v% based on the total wt or v of the total composition.

30 The cleaning kit/composition of the invention may further comprise a stabiliser in the second component. Generally the stabiliser is included in the solution of the second component in an amount of 0.03 - 15wt% or v%, 0.05 - 10wt% or v%, more typically

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0.1 - 5wt% or v% and even more typically 1 - 5wt% or v% and yet even more typically 1 - 3wt% or v%. Typically the amount of stabiliser used is present in a range selected from the group consisting of a - b (wt% or v% based on the weight or volume of the first and/or second components or the kit or the cleaning composition) listed in Table X above

5 where a is selected from the group consisting of a value presented in the column headed "a" in Table X above at one of entries 1-26, and b is selected from the group of the values presented in the column headed "b" adjacent the corresponding "a" entry. The idea behind the inclusion of the stabiliser stabilises the oxidising agent so that it can be stored for long periods of time. Examples of stabilisers are silicates (including calcium silicate,

10 magnesium silicate, sodium silicate, potassium silicate and ammonium silicate), water-soluble phosphates such as polyphosphates including tri-polyphosphate and sodium ortho- and pyro-phosphates, EDTA, tartaric acid, sodium pyrophosphate, nitrilotriacetates (NTA) including nitriloacetic acid, 1-hydroxyethane-1,1-diphosphonic acid, amino-tris-(methylenephosphonic acid), gluconic acid, sodium gluconate, phosphonobutane

15 tricarboxylic acid, ethylenediamine tetrakis-(methylenephosphonic acid), polycarboxylates, citrates, amino-polyphosphonates including nitrilotris phosphate ($N(CH_2PO_3H_2)_3$), the Dequest range generally, and, in particular, including Dequest 2000, 2010, 2016D, 2041, 2046, 2054, 2060S, 2066 or Dequest 2006; the Briquest range generally including **BRIQUEST** 221-60A, (2-

20 Hydroxyethyliminobis(methylenephosphonic), $HOCH_2CH_2N(CH_2PO_3H_2)_2$, **BRIQUEST** 231-A, iso-Propyliminobis-(methylenephosphonic), $i-PrN(CH_2PO_3H_2)_2$, **BRIQUEST** 2N31-A, n-Propyliminobis-(methylenephosphonic), $n-PrN(CH_2PO_3H_2)_2$, **BRIQUEST** 2N41-A, n-Butyliminobis-(methylenephosphonic), $n-BuN(CH_2PO_3H_2)_2$, **BRIQUEST** 2N61-A, n-Hexyliminobis-(methylenephosphonic), $n-HexylN(CH_2PO_3H_2)_2$, **BRIQUEST**

25 2N71-A, n-Heptyliminobis(methylenephosphonic), $n-HeptylN(CH_2PO_3H_2)_2$, **BRIQUEST** 281-A, (2-Ethylhexyl) iminobis-(methylenephosphonic), $(2-Ethylhexyl)N(CH_2PO_3H_2)_2$, **BRIQUEST** 2N81-A, n-Octyliminobis-(methylenephosphonic), $n-octylN(CH_2PO_3H_2)_2$, **BRIQUEST** 291-A, iso-Nonyliminobis-(methylenephosphonic), $iso-nonylN(CH_2PO_3H_2)_2$, **BRIQUEST** 2121-A, Dodecyliminobis-(methylenephosphonic), $dodecylN(CH_2PO_3H_2)_2$, **BRIQUEST** ADPA-60A, 1-Hydroxyethane-1,1-diphosphonic, $CH_3C(OH)(PO_3H_2)_2$, **BRIQUEST** 301-50A, Nitrilotris-(methylenephosphonic), $N(CH_2PO_3H_2)_3$, **BRIQUEST** 422-100A, Ethylenediaminetetrakis-(methylenephosphonic), $[CH_2N(CH_2PO_3H_2)_2]_2$, **BRIQUEST** 462-A,

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Hexamethylenediaminetetrakis-(methylenephosphonic), $[\text{C}_3\text{H}_6\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_2]_2$,
BRIQUEST 543-45AS, Diethylenetriamine- pentakis (methylenephosphonic),
 $\text{H}_2\text{O}_3\text{PCH}_2\text{N}[\text{C}_2\text{H}_4\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_2]_2$, **BRIQUEST 664-A**, Triethylenetetramine- hexakis
(methylenephosphonic), $\text{C}_{12}\text{H}_{36}\text{N}_4\text{O}_{18}\text{P}_6$, **BRIQUEST 785-A**, Tetraethylenepentamine-
5 heptakis (methylenephosphonic), $\text{C}_{15}\text{H}_{44}\text{N}_5\text{O}_{21}\text{P}_7$, **BRIQUEST 8106-A**,
Pentaethylenehexamine- octakis (methylenephosphonic), $\text{C}_{18}\text{H}_{52}\text{N}_6\text{O}_{24}\text{P}_8$, as well as the
sodium, potassium and ammonium salts of all these acids, aminophosphonate acids such
as ethylene diamine tetra(methylene phosphonic acid), aminotri(methylene phosphonic
acid), diethylenetriamine penta(methylene phosphonic acid), 1-hydroxy ethylidene (1,1-
10 diphosphonic acid), ethylene diamine tetra (methylene phosphonic acid), hexamethylene
diamine tetra (methylene phosphonic acid), diethylene triamine penta (methylene
phosphonic acid), as well as the sodium, potassium and ammonium salts of all these
acids), the salts of ethylenediamine tetraacetic acid (EDTA) such as ethylenediaminetetra-
acetic acid disodium salt, ethylenediaminetetraacetic acid diammonium salt,
15 ethylenediamine, ethylenediaminetetraacetic acid trisodium salt, triethylene tetramine,
ethylenediaminetetraacetic acid tetra-sodium salt, ethylenediaminetetraacetic acid tetra-
potassium salt, ethylenediaminetetraacetic acid tetrammonium salt, etc., EDTA (disodium
calcium, barium or magnesium salt), EDTA (dipotassium calcium, barium or magnesium
salt), EDTA (diammonium calcium, barium or magnesium salt, the salts of
20 diethylenetriamine-pentaacetic acid (DTPA) such as diethylenetriamine-pentaacetic acid
pentasodium salt, diethylenetri-aminepentaacetic acid pentapotassium salt,
diethylenetriamine pentaacetic acid trisodium barium, calcium or magnesium salt,
diethylenetriamine pentaacetic acid tripotassium barium, calcium or magnesium salt, etc.
the salts of (N-hydroxyethyl) ethylenediaminetriacetic acid (HEDTA) such as (N-
25 hydroxyethyl) ethylenediamine-triacetic acid trisodium salt. (N-hydroxyethyl) ethyl-
enediaminetriacetic acid tripotassium salt, etc., the salts of nitrilotriacetic acid (NTA)
such as nitrilo-triacetic acid trisodium salt, humic acid, pyridine-2,6-dicarboxylic acid,
pyridine carboxaldoxime, nitrilotriacetic acid tripotassium salt, stabilising agents such as
triethanolamine, diethanolamine, monoethanolamine, organic carboxylic acid stabilising
30 agents, organic aminopolycarboxylic acids, organic phosphoric acid stabilising agents,
inorganic phosphoric acid stabilising agents, polyhydroxy compounds, phenanthroline,
ethylenediamine diorthohydroxyphenylacetic acid, diaminopropanetetraacetic acid,
nitrilotriacetic acid, dihydroxy-ethylglycine, ethylenediaminediacetic acid (EDDA),

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ethylene-diaminedipropionic acid, iminodiacetic acid, diethylenetriaminepentaacetic acid, hydroxyethylimino-diacetic acid, diaminopropanolteraacetic acid, transcyclohexanediaminetetraacetic acid, ethylenediaminetetraacetic acid, glycol ether diaminetetraacetic acid, phosphorylated alcohol ethoxylates such as Teric 300, Teric 303, 5 Teric 304, Teric 305, Teric 306, alkali metal salts of any of the foregoing, or other like stabilisers. Preferably the stabiliser is added to the second component before storing it. Generally 0.05 to 5wt% stabiliser, based on the total weight of the second component, is added to the second component. Typically 0.1 to 5wt% or v%, more preferably 0.5 to 1wt% or v% stabiliser, based on the total weight of the second component, is added to or 10 included in the second component. Preferably nitrilotris phosphate (eg Dequest 2000 or 2006 or other Dequests or Briquests) is used as the stabiliser of the second component in the cleaning kit/composition of the invention.

The first and second components are generally aqueous solutions and it is particularly preferred to use high purity water as the solvent. A water soluble/miscible solvent may be 15 added to the surface prior to, at the same time as or after addition of the first and second components to the surface. The solvent may be in the form of a liquid or may be in the form of a gel. Alternatively, or, in addition, the solutions of the first and second components may optionally include a water soluble/miscible solvent. The amount of solvent used in the first or second component is typically 99.9 to 30wt% or v%, more 20 typically 0-35wt% or v%, even more typically 0.5-10wt or v%, even more typically 0.5-5wt or v%, preferably 99 to 60wt%, based on the total weight of the first or second component, respectively or the total wt or v of the composition. Examples of solvents are:

hydroxy compounds such as propanol, ethanol, methanol, isopropanol, n-butanol, 25 sec-butanol, pentanol, cyclohexanol, hexanol, heptanol, 2-octanol, diacetone alcohol, polyvinyl alcohol, 2-ethyl hexanol, benzyl alcohol, phenol, allyl alcohol, 2-ethyl-1,3-hexanediol, bis(2-butoxyethyl) ether, butoxyethoxypropanol, propylene glycol, hexylene glycol, ethylene glycol monobutyl ether, ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, diethylene glycol, ethyl ether, propyl ether;

30 carbonyls such as acetone, 2-butanone, cyclopentanone, 3-pentanone, 4-hydroxy-4-methyl-2-pentanone, cyclohexanone, 2-hexanone, acetic acid, ethyl acetate, propyl

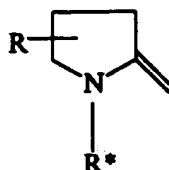
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acetate, 2-(2-ethoxyethoxy) ethanol acetate, butyl cellosolve acetate, ethyl malonate, glutaraldehyde;

nitrogen compounds such as acetonitrile, propionitrile, propylamine, trimethylamine, triethylamine, dimethylformamide, 2-amino-2-methyl-1-propanol, 1-5 methyl-2-pyrrolidone, N-ethylpyrrolidone, N-butylpyrrolidone, N-dodecylpyrrolidone, N-octylpyrrolidone, N-isooctylpyrrolidone, or other alkyl pyrrolidone of the formula:



where R is H or a linear or branched alkyl having from 1 - 12 carbon atoms, and R* is a linear or branched alkyl having from 1 - 12 carbon atoms, dimethyl ethanolamine, 10 diisopropanolamine, monoethanolamine;

other solvents such as 2-methoxyethanol, 2-butoxyethanol, 2-(2-methoxyethoxy)ethanol.

Further examples of water soluble/miscible solvents are described in "Organic Solvents Physical Properties and Methods of Purification", John A. Riddick, William B. Bunger 15 and Theodore K. Sakano, fourth edition, Volume II, John Wiley & Sons 1986, "Chemical Safety Data Sheets", David Walsh (editor), Volume I, The Royal Society of Chemistry 1989, and "Industrial Water-Based Paint Formulations", Ernest W. Flick, Noyes Publications, 1988, the contents of which are incorporated herein by cross reference.

Generally water is used as the solvent of the first and second components and 20 monoethanolamine is used as a solvent with Merpol A. Preferably purified water is used as the solvent of the first and second components. Examples of purified water are deionised water, distilled water, filtered water and other like purified waters. Usually, the water used as the solvent of the first and second components is water which has been purified by degassing, boiling and distilling and cooling and condensing the water vapour. 25 Preferably the water is first degassed in a degassing chamber and then boiled at 43°C in a vacuum and the water vapour is then cooled. Typically the quality of purified water is such that it has a conductivity $\mu\text{S}/\text{cm}$ at 35°C of <2.0, the total dissolved solids are <1ppm, the amount of sodium ions is <0.1mg/L, the amount of calcium ions is

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<0.01mg/L, the amount of magnesium ions is <0.05mg/L and the amount of ammonium ions is <0.2mg/L.

Typical cleaning compositions include:

- (a) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-5 7.9wt% or v:v% calcium chloride; 0.05-2wt% or v:v% glucose; 0.05-2wt% or v:v% fluorosurfactant; and remainder - high purity water;
- (b) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-7.9wt% or v:v% calcium chloride; 0.05-2wt% or v:v% fluorosurfactant; and remainder high purity water;
- 10 (c) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-7.9wt% or v:v% calcium chloride; 0.05-2wt% or v:v% fluorosurfactant; and remainder high purity water;
- (d) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt peroxide stabilizer; 2.5-7.9wt% or v:v% calcium chloride; 0.05-2wt% or v:v% fluorosurfactant; and remainder 15 high purity water;
- (e) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-7.9wt% calcium chloride; 0.05-2wt% or v:v% 2-butyne-1,4-diol; 0.05-2wt% or v:v% fluorosurfactant; and remainder - high purity water;
- (f) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-20 7.9wt% calcium chloride; 0.0-2wt% or v:v% N-methylpyrrolidone; 0.0-4wt% or v:v%, typically 1.5wt% or v:v%, triethanolamine (TEA); 0.0-4wt% or v:v%, typically 1.5wt% or v:v%, monoethanolamine (MEA); 0.05-2wt% or v:v% fluorosurfactant; and remainder - high purity water;
- (g) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-25 10wt% calcium chloride; 4wt% or v:v%, triethanolamine (TEA) and/or monoethanolamine (MEA); perfume as desired; and remainder - high purity water;
- (h) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% or v:v% peroxide stabilizer; 5-15.8wt% or v:v% calcium chloride; 0.05-4wt% or v:v% fluorosurfactant; and remainder - high purity water;
- 30 (i) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% or v:v% peroxide stabilizer; 5-15.8wt% or v:v% calcium chloride; 0.0-4wt% or v:v% fluorosurfactant; and remainder - high purity water.

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(j) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% or v:v% peroxide stabilizer; 5-15.8wt% or v:v% calcium chloride; 0.0-4wt% or v:v%, typically 1.5wt% or v:v%, triethanolamine (TEA); and remainder - high purity water.

According to another embodiment of this invention there is provided a method of cleaning
5 and/or bleaching a stained surface, comprising:

applying to the surface a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent applied to the surface;

applying to the surface a second component comprising an oxidising agent to oxidise and bleach the stain on or in the surface, said oxidising agent being one whose oxidising
10 ability is capable of being enhanced by said enhancing agent; and

optionally mixing the first and second components prior to and/or after applying the first and second components to the surface.

The first and second components are generally left on the stained surface for a time sufficient to effectively clean and/or bleach the stained surface.

15 According to another embodiment of this invention there is provided a method of cleaning a concrete surface, comprising:

applying to the surface a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent applied to the surface;

applying to the surface a second component comprising an oxidising agent to oxidise
20 organic matter on or in the surface, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent; and

optionally mixing the first and second components prior to and/or after applying the first and second components to the surface.

The first and second components are generally left on the concrete surface for a time
25 sufficient to effectively clean the concrete surface.

According to another embodiment of this invention there is provided a method of cleaning a brick surface, comprising:

applying to the surface a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent applied to the surface;

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applying to the surface a second component comprising an oxidising agent to oxidise organic matter on or in the surface, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent; and

optionally mixing the first and second components prior to and/or after applying the
5 first and second components to the surface.

The first and second components are generally left on the brick surface for a time sufficient to effectively clean the brick surface.

According to another embodiment of this invention there is provided a method of cleaning grout, comprising:

10 applying to the grout a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent applied to the grout;

applying to the grout a second component comprising an oxidising agent to oxidise organic matter on or in the grout, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent; and

15 optionally mixing the first and second components prior to and/or after applying the first and second components to the grout.

The first and second components are generally left on the grout for a time sufficient to effectively clean the grout.

According to another embodiment of this invention there is provided a method of cleaning
20 a human or animal mouth, comprising:

applying to the mouth a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent applied to the mouth;

applying to the mouth a second component comprising an oxidising agent to oxidise organic matter on or in the mouth, said oxidising agent being one whose oxidising ability
25 is capable of being enhanced by said enhancing agent; and

optionally mixing the first and second components prior to and/or after applying the first and second components to the mouth.

The first and second components are generally left in the mouth for a time sufficient to effectively clean the mouth.

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According to another embodiment of this invention there is provided a method of treating a human or animal mouth or treating a mouth requiring treatment for a preventable or treatable condition, comprising:

applying to the mouth a first component comprising an enhancing agent to enhance
5 the oxidising ability of an oxidising agent applied to the mouth;

applying to the mouth a second component comprising an oxidising agent to oxidise organic matter on or in the mouth, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent; and

optionally mixing the first and second components prior to and/or after applying the
10 first and second components to the mouth.

The first and second components are generally left in the mouth for a time sufficient to effectively treat the mouth.

According to a further embodiment of this invention there is provided a method of cleaning a water in a swimming pool comprising:

15 applying to the swimming pool water a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent applied to the swimming pool water;

applying to the swimming pool water a second component comprising an oxidising agent to oxidise organic matter in the swimming pool water, said oxidising agent being
20 one whose oxidising ability is capable of being enhanced by said enhancing agent; and

optionally mixing the first and second components prior to and/or after applying the first and second components to the swimming pool water.

According to a further embodiment of this invention there is provided a method of a cleaning human or animal skin or treating human or animal skin requiring treatment for a
25 preventable or treatable condition, comprising:

applying to the skin a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent applied to the skin;

applying to the skin a second component comprising an oxidising agent to oxidise organic matter on or in the skin, said oxidising agent being one whose oxidising ability is
30 capable of being enhanced by said enhancing agent; and

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optionally mixing the first and second components prior to and/or after applying the first and second components to the skin.

The first and second components are generally left on the skin for a time sufficient to effectively clean/treat the skin.

5 According to another embodiment of this invention there is provided a method of cleaning and/or bleaching a stained surface, comprising:

applying to the surface, optionally a dry surface, a solvent to dissolve the stain on the surface;

applying to the surface a first component comprising an enhancing agent to enhance
10 the oxidising ability of an oxidising agent applied to the surface;

applying to the surface a second component comprising an oxidising agent to oxidise and bleach the stain on or in the surface, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent; and

optionally mixing the solvent and the first and second components prior to and/or
15 after applying the first and second components to the surface.

The solvent, first and second components are generally scrubbed separately or together on the surface and are typically left on the stained surface for a time sufficient to effectively clean and/or bleach the stained surface. Typically the solvent is applied first as a liquid or gel to a dry surface together with a surfactant (0.05-50wt%, more typically .5-5wt% of
20 the solvent) and scrubbed on the surface and left there for a time sufficient to dissolve the stain. The solvent may be left on the surface or rinsed therefrom and the first and second components are then added to the surface, scrubbed into the surface and left on the stained surface for a time sufficient to effectively clean and/or bleach the stained surface. The surface is then rinsed typically with cold or hot water.

25 Generally the first component and the second component are applied to the surface or the aqueous liquid simultaneously or in succession with the first component being applied to the surface or the aqueous liquid first, followed by the application of the second component. Alternatively, the second component may be applied to the surface or the aqueous liquid first, followed by the application of the first component. Preferably the
30 first component is applied to the surface or the aqueous liquid first, followed by the application of the second component.

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Generally the first component is applied to the surface as a warm aqueous solution, typically 25-100°C, and the second component is applied to the surface when covered by the warm first component.

Typically, the first and second components are mixed. The components may be mixed 5 prior to application, so that only one application step takes place. Alternatively, the components may be mixed after they have been applied to the surface. In this case, mixing usually occurs by scrubbing the components on or into the surface. Generally equal volumes of the first and second components are used in the cleaning kit/composition of the invention.

10 If the first and second components are applied to the surface as separate components, generally the first component is first applied to the surface. The first component may be applied by spraying, pouring, painting, soaking, layering, or dipping the surface in the first component. Generally the first component may be prepared as a solution, paste, cream, gel, aerosol or other like preparation. Usually the first component is prepared as 15 an aqueous solution. Typically the first component is diluted with water having a temperature range of 5-100°C, typically 25-100°C, preferably 50-90°C, more preferably 60-80°C. The first component is typically poured on the surface when warm (30-100°C). Generally the second component is applied to the surface by spraying, pouring, painting, layering, or dipping the surface in the second component. Generally the second 20 component may be prepared as a solution, paste, cream, gel, aerosol or other like preparation. Usually the second component is prepared as an aqueous solution. Preferably the second component is diluted with purified water. The second component is typically applied whilst the surface is covered with the warm first component. Typically the first and second components are mixed together by scrubbing the surface for a time 25 sufficient to effect mixing. Generally scrubbing takes place for 3 seconds to 24 hours, typically 5 to 20 minutes, preferably 5 to 10 minutes and even more preferably 10 seconds to 1 minute. The surface may be allowed to dry to discourage the re-establishment of microorganisms. Alternatively, the surface may be rinsed with water to remove excess first component, second component and any debris resulting from the 30 cleansing action of the first and second components.

The first and second components may be allowed to stand prior to scrubbing or after scrubbing to penetrate and clean the surface, especially if the surface is porous. Generally

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the time is chosen such that it is sufficient to clean the surface. The first and second components may be allowed to stand on the surface for 0.1 minute to 24 hours, typically 1 minute to 24 hours, more typically 5 to 20 minutes, preferably 5 to 10 minutes.

Generally if the additive(s) has not been included in the first and/or second component, 5 the additive(s) may be added before or after application of the first component, or before or after application of the second component. Alternatively the additive(s) may be added at the same time as the first and/or the second component. Generally the additive(s) is applied to the surface by spraying, pouring, painting, layering, or dipping the surface in the additive(s). Generally the additive(s) may be prepared as a solution, paste, cream, 10 gel, aerosol or other like preparation. Usually the additive(s) is mixed with the first and/or second component before application, alternatively the additive(s) may be scrubbed on or into the surface with the first and/or second component.

Generally the first component and the second component may be prepared *in situ* or may be stored in a cool, ventilated area for several months to years and may be stored as a 15 concentrated solution.

Generally components A to A₃ and components B to B₃ may be dispensed separately from separate containers or dispensed from an integral multi-compartmented container. Examples of dispensers are posi-pour measures, Emu measures, optic measures, straight through pourers such as speed pourers or tubes or other like dispensers which can deliver 20 a predetermined amount of components A to A₃ and components B to B₃. The dispenser may or may not be integral with the container.

Generally the cleaning kit/composition of the invention cleans any organic matter for example microorganisms such as algae, fungus, bacteria, yeast, lichen, moss, protozoa; excreta; food; vegetation; or other like organic matter or microorganisms or mixtures 25 thereof.

Generally the stains bleached by the cleaning kit/composition of the invention are stains caused by dyes, tints, pigments, vegetable matter, excreta or other like stains or mixtures thereof.

After the surface is cleaned, or bleached, or after the microorganisms have been killed, a 30 coating may be applied to the surface. Examples of coatings are a reinforcing pigment such as sodium silicate, magnesium silicate, aluminium silicate, barium sulphate silica, potassium-aluminium silicate; a colour-carrying pigment coating such as toluidine red,

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iron oxide red, monastral red, dmium red, iron oxide, molybdenum orange, yellow iron oxide, nickel titanate, chrome yellow, phthalocyanine green, chrome oxide, phthalocyanine blue, lamp black, carbon black, titanium dioxide, aluminium flake, zinc dust, stainless-steel flake, lead flake; inhibitive pigment coating such as zinc powder, red
5 lead, lead chromate, barium chromate, basic zinc chromate, strontium chromate, zinc chromate; vinyl coating such as vinyl chloride-vinyl acetate copolymer coating; chlorinated rubber coating; epoxy coating; amine-cured epoxy; polyamine-cured epoxy; phenolic epoxy; coal tar epoxy; phenolic coating; inorganic zinc coating; polyurethane coating; or other like coatings.

- 10 An advantage of the cleaning kit/composition of the invention is that excesses of the oxidising agent (or hydrogen peroxide) are likely to be readily decomposed by sunlight and atmospheric exposure, or in contact with surrounding soil, leaving a residue of water and enhancing agent (or calcium chloride). Another advantage is that excess calcium chloride absorbed into the surface is likely to lose water to the air until coming into
15 balance with the hygroscopic nature of calcium chloride, leaving a concentrated solution soaked in to the surface. This will tend to discourage the re-establishment of microorganisms. This effect may be minimised if the surface is later cleaned by high pressure water to remove organic residues. Further advantages are that the enhancing agent and oxidising agent are prepared *in situ* and excess will decompose in a relatively
20 short time. The enhancing agent and oxidising agent are not dangerous goods and final residues are not harmful to the environment, provided the surfactant used is thoroughly biodegradable. Irritating products are not released to the atmosphere, for example, a sodium hypochlorite solution is currently used to clean a concrete surface. In comparison, the cleaning kit/composition of the invention is a lot more pleasant to use
25 than sodium hypochlorite solution. Another advantage of the cleaning kit/composition of the invention is that it can be safely used in beer cellars because no chlorine is released. A further advantage of the cleaning kit/composition of the invention is that the combination of the warmed calcium chloride solution and the hydrogen peroxide enhances the disinfecting ability of the cleaning kit.
- 30 According to a further embodiment of this invention there is provided a stabilised oxidising agent in a solvent, comprising:
an oxidising agent dissolved in the solvent; and

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an effective stabilising amount of a stabilising agent dissolved in the solvent to stabilise the oxidising agent.

According to yet a further embodiment of this invention there is provided method of preparing a stabilised oxidising agent in a solvent, comprising:

5 dissolving an oxidising agent in the solvent; and

dissolving an effective stabilising amount of a stabilising agent in the solvent to stabilise the oxidising agent.

The oxidising agent may be dissolved in the solvent prior to, at the same time or after the stabilising agent is dissolved in the solvent.

10 Generally the stabilising agent comprises at least one amino-polyphosphonate. The amino-polyphosphonate may be, for instance, nitrilotris phosphate ($N(CH_2PO_3H_2)_3$) and in particular, the Briquest range generally, the Dequest range generally, and, in particular, Dequest 2000, Dequest 2010, or Dequest 2006.

Generally the solvent comprises water, especially highly purified water including high
15 purity deionised and distilled water and in particular high purity water containing low levels of metal ions.

Typically the oxidising agent is a peroxide such as hydrogen peroxide, zinc peroxide, benzoyl peroxide, potassium peroxide, t-butyl hydroperoxide, sodium peroxide, urea
hydrogen peroxide, magnesium peroxide, or calcium peroxide. Typically the peroxide is
20 hydrogen peroxide.

Typically the v:v or w:w or v:w or w:v, stabilising agent:oxidising agent is in the range 1:25 to 5:1, more typically 1:5 to 3:1, even more typically 0.1:3.5 to 1.5:10 and yet even more typically 0.7:3 or 1.4:7.

Typically the v:v or w:w or v:w or w:v, oxidising agent:solvent is 0.005:1 to 0.75:1,
25 typically 0.01:1 to 0.35:1, more typically 0.02:1 to 0.05:1, and yet even more typically 0.03:1.

Typically the v:v or w:w or v:w or w:v, stabilising agent:solvent is 0.001:1 to 0.50:1, typically 0.003:1 to 0.25:1, more typically 0.005:1 to 0.05:1, and yet even more typically 0.007:1.

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Best Mode and Other Modes For Carrying Out The Invention

A cleaning kit/composition for cleaning a surface, generally comprises 50wt% of a first component, based on the total weight of the cleaning kit/composition and 50wt% or v% of a second component, based on the total weight of the cleaning
5 kit/composition. Preferably the first component comprises 50wt%, preferably 20wt%, of an aqueous solution of calcium chloride and the second component comprises 50wt% or v% (v=volume), typically up to 20 wt% or v% and more typically 7.9wt% or v%, of an aqueous solution of hydrogen peroxide. Optionally 0.1-10wt% or v%, more typically 0.5-5wt% or v% and even more typically 1wt% or v% fluorosurfactant, based on the total
10 weight of the cleaning kit/composition is preferably added to the first component. The preferred fluorosurfactant is Merpel A. Preferably the calcium chloride solution contains 0.1wt% Merpel A. Optionally 0.5 to 1wt% stabiliser, based on the total weight of the second component is preferably added to the second component. The preferred stabiliser is Dequest 2000 or Dequest 2006. Preferably the hydrogen peroxide solution contains 0.5
15 to 1wt% Dequest 2000. Typically the pH of the first and second components ranges from 2 to 13, more typically 2.0 to 9.0. Approximately equal volumes of the calcium chloride and hydrogen peroxide solutions are used. Use of calcium chloride is particularly advantageous as it is a hygroscopic material. Thus large areas of concrete or cement, for example, can be covered on a hot day without drying out prior to application of the
20 hydrogen peroxide aqueous solution.

Generally to clean a surface, an aqueous solution of 50wt% calcium chloride is diluted to 10 to 25wt%, preferably 20wt%, based on the total weight of the first component. The calcium chloride solution is preferably diluted with water having a temperature range of 35-90°C. The diluted aqueous calcium chloride solution is applied to the surface by
25 spraying or pouring it onto the surface. Preferably the diluted calcium chloride solution is sprayed or poured whilst still warm (30-90°C).

An aqueous solution of 3 to 20wt% or v%, more typically 5 to 7.9wt% or v% hydrogen peroxide, preferably 7.9wt% or v%, based on the total weight of the second component is diluted with purified water. The diluted aqueous hydrogen peroxide solution is applied to
30 the surface covered with the diluted warm aqueous calcium chloride solution. The diluted aqueous hydrogen peroxide solution is typically applied by spraying or pouring it onto the surface. Usually the aqueous calcium chloride/hydrogen peroxide is scrubbed on or into

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the surface. Scrubbing in this way mixes the hydrogen peroxide with the calcium chloride. Generally the aqueous calcium chloride/hydrogen peroxide mixture is allowed to remain on the surface for 1 minute to 24 hours, typically 5 to 20 minutes, preferably 10 to 15 minutes. After standing, the surface is rinsed with water to remove excess hydrogen peroxide, calcium chloride and any debris resulting from the cleansing action of the cleaning kit.

An alternative cleaning kit/composition for cleaning a surface, generally comprises 50wt% of a first component, based on the total weight of the cleaning kit/composition and 50wt% or v% of a second component, based on the total weight or volume of the cleaning kit/composition. Preferably the first component comprises 50wt%, preferably 20wt%, of an aqueous solution of calcium chloride and the second component comprises 50wt% or v%, typically 20wt% or v%, preferably 7.9wt% or v%, of an aqueous solution of hydrogen peroxide. Optionally 1wt% fluorosurfactant, based on the total weight of the cleaning kit/composition is preferably added to the first component. The preferred fluorosurfactant is Merspol A. Preferably the calcium chloride solution contains 0.1wt% Merspol A. Typically the pH of the first and second components ranges from 7 to 10. Approximately equal volumes of the calcium chloride and hydrogen peroxide solutions are used. Use of calcium chloride is particularly advantageous as it is a hygroscopic material. Thus large areas of concrete or cement, for example, can be covered on a hot day without drying out prior to application of the hydrogen peroxide aqueous solution.

Generally to clean a surface, an aqueous solution of 50wt% calcium chloride is diluted to 10 to 25wt%, preferably 20wt%, based on the total weight of the first component. The diluted aqueous calcium chloride solution is applied to the surface by spraying or pouring it onto the surface.

An aqueous solution of 30wt% or v%, more typically 20wt% or v%, hydrogen peroxide is diluted to 5 to 7.9wt% or v%, preferably 7.9wt% or v%, based on the total weight of the second component. The diluted aqueous hydrogen peroxide solution is applied to the surface covered with the diluted aqueous calcium chloride solution. The diluted aqueous hydrogen peroxide solution is typically applied by spraying or pouring it onto the surface. Usually the aqueous calcium chloride/hydrogen peroxide is scrubbed on or into the surface. Scrubbing in this way mixes the hydrogen peroxide with the calcium chloride. Generally the aqueous calcium chloride/hydrogen peroxide mixture is allowed to remain

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on the surface for 1 minute to 24 hours, typically 5 to 20 minutes, preferably 10 to 15 minutes. After standing, the surface is rinsed with water to remove excess hydrogen peroxide, calcium chloride and any debris resulting from the cleansing action of the cleaning kit.

5

Example 1

To typically clean a concrete surface, a 20wt% aqueous calcium chloride solution is sprayed or poured onto the concrete surface so that it thoroughly wets the concrete and penetrates a little into the surface, especially, if the surface is porous. When the surface needs to be cleaned of oils and grease, the aqueous calcium chloride solution contains 10 0.1wt% Merpel A.

Whilst the surface is still wet with the calcium chloride solution, a 7.9wt% aqueous hydrogen peroxide solution is sprayed or poured onto the concrete surface. The aqueous hydrogen peroxide solution is scrubbed into the concrete and this causes the hydrogen peroxide to mix with the calcium chloride. The concrete surface is scrubbed for 15 approximately 10 to 15 minutes.

The calcium chloride and hydrogen peroxide may be left on the concrete surface to discourage the re-establishment of microorganisms. Alternatively the calcium chloride and hydrogen peroxide is rinsed with water to remove excess hydrogen peroxide, calcium chloride and any debris resulting from the cleansing action.

20

Example 2

A warm (40-50°C) 20wt% aqueous calcium chloride solution was poured onto a concrete surface to be cleaned so that it thoroughly wetted the concrete.

Whilst the surface was still wet with the warm (40-50°C) calcium chloride solution, a 7.9wt% aqueous hydrogen peroxide solution containing 0.5 to 1wt% Dequest 2000 was 25 poured onto the wetted concrete surface. The aqueous hydrogen peroxide/warm calcium chloride mixture was scrubbed on the concrete surface thus causing the hydrogen peroxide to mix with the warm calcium chloride. The concrete surface was scrubbed for approximately 1 to 3 minutes. The mixed solution was then left on the concrete surface for 10 minutes and then washed off with water to leave a clean concrete surface.

30

Example 3

A warm (30-40°C) aqueous 3wt% calcium chloride/3v% hydrogen peroxide composition was administered topically to human scaly skin so that it thoroughly wetted the affected

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area on the skin and was left there for 5 minutes, whereupon it visibly reacted with the scaly skin but did not visibly react with the healthy skin surrounding the scaly skin. The composition was then washed thoroughly from the skin with water. The treated skin did not have the scales that were present prior to treatment and the surrounding healthy skin 5 that had been contacted by the composition appeared unchanged.

Example 4

An aqueous 3wt% calcium chloride (food grade)/3v% hydrogen peroxide (food grade) composition was administered orally to a person's mouth and was left there for 1-2 minutes. The composition was removed from the mouth and the mouth rinsed with water. 10 The teeth in the treated mouth were visibly whiter and the user's mouth felt clean and fresh.

Example 5

Calcium chloride 0.005wt% - 0.1wt% is dissolved in the swimming pool water and up 1-500ppm hydrogen peroxide is added to the water and maintained at that level by 15 periodically adding hydrogen peroxide to the water.

Example 6

Dequest 2000 or 2006 (nitrilotris 301-50A, $N(CH_2PO_3H_2)_3$) up to 0.01 - 1v% and 0.5 - 3%v/v hydrogen peroxide is dissolved in high purity water which has been purified by degassing, boiling and distilling and cooling and condensing the water vapour. The water 20 is first degassed in a degassing chamber and then boiled at 43°C in a vacuum and the water vapour is then cooled. Typically the quality of purified water is such that it has a conductivity $\mu S/cm$ at 35°C of <2.0, the total dissolved solids are <1ppm, the amount of sodium ions is <0.1mg/L, the amount of calcium ions is <0.01mg/L, the amount of magnesium ions is <0.05mg/L and the amount of ammonium ions is <0.2mg/L. The 25 aqueous composition may be stored in an air tight container with minimal degassing of the peroxide.

Example 7

- (a) A one part aqueous cleaning composition of the following was found to have an effective shelf life:
- 30 2.5-7.9wt% or v:v% hydrogen peroxide;
 - 0.25 to 2wt% Dequest 2000;

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2.5-7.9wt% or v:v% calcium chloride;

0.05-2wt% or v:v% glucose;

0.05-2wt% or v:v% Merpol; and

remainder - high purity water.

5 (b) A one part aqueous cleaning composition of the following was found to have an effective shelf life:

2.5-7.9wt% or v:v% hydrogen peroxide;

0.25 to 2wt% Dequest 2000;

2.5-7.9wt% or v:v% calcium chloride;

10 0.05-2wt% or v:v% Merpol; and

remainder high purity water.

(c) A one part aqueous cleaning composition of the following was found to have an effective shelf life:

2.5-7.9wt% or v:v% hydrogen peroxide;

15 0.25 to 2wt% Dequest 2006;

2.5-7.9wt% or v:v% calcium chloride;

0.05-2wt% or v:v% Merpol; and

remainder high purity water.

(d) A one part aqueous cleaning composition of the following was found to have an effective shelf life:

2.5-7.9wt% or v:v% hydrogen peroxide;

0.25 to 2wt% **BRIQUEST** 664-A;

2.5-7.9wt% or v:v% calcium chloride;

0.05-2wt% or v:v% Merpol; and

25 remainder high purity water.

(e) A one part aqueous cleaning composition of the following was found to have an effective shelf life:

2.5-7.9wt% or v:v% hydrogen peroxide;

0.25 to 2wt% Dequest 2000;

30 2.5-7.9wt% calcium chloride;

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0.05-2wt% or v:v% 2-butyne-1,4-diol;

0.05-2wt% or v:v% Mervol; and

remainder - high purity water.

(f) A one part aqueous cleaning composition of the following was found to have an effective shelf life:

2.5-7.9wt% or v:v% hydrogen peroxide;

0.25 to 2wt% Dequest 2000;

2.5-7.9wt% calcium chloride;

0.0-2wt% or v:v% N-methylpyrrolidone;

10 0.0-4wt% or v:v%, typically 1.5wt% or v:v%, triethanolamine (TEA);

0.0-4wt% or v:v%, typically 1.5wt% or v:v%, monoethanolamine (MEA);

0.05-2wt% or v:v% Mervol; and

remainder - high purity water.

(g) A one part aqueous cleaning composition suitable for use as a hard surface cleaner of the following was found to have an effective shelf life:

2.5-7.9wt% or v:v% hydrogen peroxide;

0.25 to 2wt% Dequest 2000;

2.5-10wt% calcium chloride;

4wt% or v:v%, triethanolamine (TEA) and/or monoethanolamine (MEA);

20 perfume as desired; and

remainder - high purity water.

Example 8

A one part cleaning composition of the following was found to have an effective shelf life:

25 **Formulation (a)**

2.5-7.9wt% or v:v% hydrogen peroxide;

0.25 to 2wt% or v:v% Dequest 2000;

5-15.8wt% or v:v% calcium chloride;

0.05-4wt% or v:v% Mervol; and

30 remainder - high purity water.

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Formulation (b)

2.5-7.9wt% or v:v% hydrogen peroxide;

0.25 to 2wt% or v:v% Dequest 2000;

5-15.8wt% or v:v% calcium chloride;

5 0.0-4wt% or v:v% Merpol; and

remainder - high purity water.

Formulation (c)

2.5-7.9wt% or v:v% hydrogen peroxide;

0.25 to 2wt% or v:v% Dequest 2000;

10 5-15.8wt% or v:v% calcium chloride;

0.0-4wt% or v:v%, typically 1.5wt% or v:v%, triethanolamine (TEA); and

remainder - high purity water.

Example 9

Gelled N-methyl pyrrolidone (NMP) with 1.0v:v% surfactant was applied to a surface
15 marked with graffiti, scrubbed into the graffiti, left for 5-10 minutes. The surface was
then rinsed with warm water. A one part cleaning composition of 7.9v:v% hydrogen
peroxide, 0.1v:v% Dequest 2000, 15.8 v:v% calcium chloride; and 0.2v:v% Merpol was
applied to the surface, scrubbed into the surface and let there for 5-10 minutes before
being rinsed off with warm water with the result that the graffiti had been substantially
20 removed from the surface.

Example 10

Dequest 2000, Dequest 2010, or Dequest 2006, 0.5 - 1.5v% and 0.5 - 7%v/v hydrogen
peroxide is dissolved in high purity distilled water. Typically the quality of purified water
is such that it has a conductivity $\mu\text{S}/\text{cm}$ at 35°C of <2.0 , the total dissolved solids are
25 $<1\text{ppm}$, the amount of sodium ions is $<0.1\text{mg}/\text{L}$, the amount of calcium ions is
 $<0.01\text{mg}/\text{L}$, the amount of magnesium ions is $<0.05\text{mg}/\text{L}$ and the amount of
ammonium ions is $<0.2\text{mg}/\text{L}$. The aqueous composition may be stored in an air tight
container with minimal degassing of the peroxide.

Example 11

30 Nitrilotris phosphate ($\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_3$), 0.25 - 2.5v% and 0.25 - 7%v/v hydrogen
peroxide is dissolved in high purity distilled water. Typically the quality of purified water

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is such that it has a conductivity $\mu\text{S/cm}$ at 35°C of <2.0 , the total dissolved solids are $<1\text{ppm}$, the amount of sodium ions is $<0.1\text{mg/L}$, the amount of calcium ions is $<0.01\text{mg/L}$, the amount of magnesium ions is $<0.05\text{mg/L}$ and the amount of ammonium ions is $<0.2\text{mg/L}$. The aqueous composition may be stored in an air tight container with minimal degassing of the peroxide.

Example 12

Dequest 2000, Dequest 2010, or Dequest 2006, 0.3 - 3.5v% and 0.2 - 7%v/v hydrogen peroxide is dissolved in high purity deionised water. The aqueous composition may be stored in an air tight container with minimal degassing of the peroxide.

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Example 13

Nitrilotris phosphate ($\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_3$), 0.1 - 4.5v% and 0.2 - 7%v/v hydrogen peroxide is dissolved in high purity deionised water. The aqueous composition may be stored in an air tight container with minimal degassing of the peroxide.

Example 14

15 Dequest 2000, Dequest 2010, or Dequest 2006, 0.3 - 3.5v% and 0.2 - 7%v/v hydrogen peroxide is dissolved in deionised and distilled water. The aqueous composition may be stored in an air tight container with minimal degassing of the peroxide.

Example 15

20 Nitrilotris phosphate ($\text{N}(\text{CH}_2\text{PO}_3\text{H}_2)_3$), 0.1 - 4.5v% and 0.2 - 7%v/v hydrogen peroxide is dissolved in high purity deionised and distilled water. The aqueous composition may be stored in an air tight container with minimal degassing of the peroxide.

Industrial Applicability

The cleaning kit/composition of the invention can be readily utilised for cleaning a surface, killing microorganisms, or bleaching stains from a surface.

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Claims

1. A cleaning composition comprising:
 - a first component comprising an enhancing amount of an enhancing agent to enhance the oxidising ability of an oxidising agent; together with
 - 5 a second component comprising an oxidising amount of the oxidising agent, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent.
2. A cleaning composition according to claim 1 further comprising a surfactant that is substantially stable in said cleaning composition.
- 10 3. A cleaning composition according to claim 1 further comprising a stabilising agent to substantially stabilise the oxidising agent in said cleaning composition.
4. A cleaning composition according to claim 2 further comprising a stabilising agent to substantially stabilise the oxidising agent in said cleaning
- 15 composition.
5. A cleaning composition according to claim 1 wherein free chlorine is not produced in said composition.
6. A cleaning composition according to claim 1 wherein the enhancing agent discourages the re-establishment of microorganisms on a surface or in a liquid cleaned
- 20 with said cleaning composition.
7. A cleaning composition according to claim 1 further comprising a solvent selected from the group consisting of water and high purity water.
8. A cleaning composition according to claim 2 further comprising a solvent selected from the group consisting of water and high purity water.
- 25 9. A cleaning composition according to claim 3 further comprising a solvent selected from the group consisting of water and high purity water.
10. A cleaning composition according to claim 4 further comprising a solvent selected from the group consisting of water and high purity water.
11. A cleaning composition according to claim 1 wherein the enhancing agent is an
- 30 aqueous soluble alkaline earth metal salt.

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12. A cleaning composition according to claim 11 wherein the enhancing agent is an aqueous soluble alkaline earth metal halide salt.
13. A cleaning composition according to claim 11 wherein the enhancing agent is calcium chloride.
- 5 14. A cleaning composition according to claim 1 wherein the oxidising agent is a peroxygenated compound.
15. A cleaning composition according to claim 1 wherein the oxidising agent is a peroxide compound.
16. A cleaning composition according to claim 1 wherein the oxidising agent is
10 hydrogen peroxide compound.
17. A cleaning composition according to claim 1 wherein the enhancing agent is an aqueous soluble alkaline earth metal halide salt and the oxidising agent is a peroxide compound.
18. A cleaning composition according to claim 1 wherein the enhancing agent is calcium
15 chloride and the oxidising agent is hydrogen peroxide.
19. A cleaning composition according to claim 2 wherein the enhancing agent is calcium chloride and the oxidising agent is hydrogen peroxide.
20. A cleaning composition according to claim 3 wherein the enhancing agent is calcium chloride and the oxidising agent is hydrogen peroxide.
- 20 21. A cleaning composition according to claim 4 wherein the enhancing agent is calcium chloride and the oxidising agent is hydrogen peroxide.
22. A cleaning composition according to any one of claims 5 to 12 wherein the enhancing agent is calcium chloride and the oxidising agent is hydrogen peroxide.
23. A cleaning composition according to claim 1 selected from the group consisting of:
25 (a) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-7.9wt% or v:v% calcium chloride; 0.05-2wt% or v:v% glucose; 0.05-2wt% or v:v% fluorosurfactant; and remainder - high purity water;
(b) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-7.9wt% or v:v% calcium chloride; 0.05-2wt% or v:v% fluorosurfactant; and remainder
30 high purity water;

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- (c) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-7.9wt% or v:v% calcium chloride; 0.05-2wt% or v:v% fluorosurfactant; and remainder high purity water;
- (d) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt peroxide stabilizer; 2.5-5 7.9wt% or v:v% calcium chloride; 0.05-2wt% or v:v% fluorosurfactant; and remainder high purity water;
- (e) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-7.9wt% calcium chloride; 0.05-2wt% or v:v% 2-butyne-1,4-diol; 0.05-2wt% or v:v% fluorosurfactant; and remainder - high purity water;
- 10 (f) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-7.9wt% calcium chloride; 0.0-2wt% or v:v% N-methylpyrrolidone; 0.0-4wt% or v:v%, typically 1.5wt% or v:v%, triethanolamine (TEA); 0.0-4wt% or v:v%, typically 1.5wt% or v:v%, monoethanolamine (MEA); 0.05-2wt% or v:v% fluorosurfactant; and remainder - high purity water;
- 15 (g) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% peroxide stabilizer; 2.5-10wt% calcium chloride; 4wt% or v:v%, triethanolamine (TEA) and/or monoethanolamine (MEA); perfume as desired; and remainder - high purity water;
- (h) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% or v:v% peroxide stabilizer; 5-15.8wt% or v:v% calcium chloride; 0.05-4wt% or v:v% fluorosurfactant; and
- 20 remainder - high purity water;
- (i) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% or v:v% peroxide stabilizer; 5-15.8wt% or v:v% calcium chloride; 0.0-4wt% or v:v% fluorosurfactant; and remainder - high purity water.
- (j) 2.5-7.9wt% or v:v% hydrogen peroxide; 0.25 to 2wt% or v:v% peroxide stabilizer;
- 25 5-15.8wt% or v:v% calcium chloride; 0.0-4wt% or v:v%, typically 1.5wt% or v:v%, triethanolamine (TEA); and remainder - high purity water.
24. A method of cleaning/treating a surface or an aqueous liquid comprising:
applying to the surface or to the aqueous liquid an effective cleaning/treating amount of the cleaning composition of any one of claims 1 to 21.
- 30 25. A method of killing a microorganism on a surface or in an aqueous liquid comprising:

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applying to the surface or to the aqueous liquid an effective antimicrobial amount of the cleaning composition of any one of claims 1 to 21.

26. A method of cleaning/bleaching a surface selected from a stained surface, a concrete surface, a brick surface, and a grout surface, said method comprising:

5 applying to the surface an effective cleaning/bleaching amount of the cleaning composition of any one of claims 1 to 21;

leaving the cleaning composition on the surface for a time sufficient to substantially clean/bleach the surface.

27. A method of cleaning/treating a human or animal mouth, comprising:

10 an effective cleaning/treating amount of the cleaning composition of any one of claims 1 to 21.

28. A method of cleaning a water in a swimming pool comprising:

applying to the swimming pool water an effective cleaning/treating amount of the cleaning composition of any one of claims 1 to 21.

15 29. A method of cleaning human or animal skin or treating human or animal skin requiring treatment for a preventable or treatable condition, comprising:

applying to the skin an effective cleaning/treating amount of the cleaning composition of any one of claims 1 to 21.

30. A two-component cleaning kit comprising:

20 a first component comprising an enhancing agent to enhance the oxidising ability of an oxidising agent; and

a second component comprising an oxidising agent, said oxidising agent being one whose oxidising ability is capable of being enhanced by said enhancing agent.

INTERNATIONAL SEARCH REPORT

International Application No.

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A. CLASSIFICATION OF SUBJECT MATTER		
Int Cl ⁶ : C11D 3/39, 3/395, 3/48, C09D 9/00, 9/04, A61K 7/16, 7/20, 7/30, 7/48, D06L 3/02, 3/06, A01N 59/00, 59/08, A61L 2/18, C02F 1/72		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC: C11D 3/39, 3/395, 3/48, C09D 9/00, 9/04, A01N 59/00, 59/08, A61L 2/18, C02F 1/72, A61K 7/16, 7/20, 7/30, 7/48, D06L 3/02, 3/06		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: IPC as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Derwent: (CaCl ₂ or Calcium()Chloride) and (H ₂ O ₂ or Hydrogen() peroxide)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	AU,A, 32738/84 (Monsanto) 14 March 1985 (14.03.85) page 3 line 15 to page 4 line 31, examples, claims	1 to 4, 6 to 13, 24 to 26, 28
Y	whole document	1 to 30
X	AU,A, 52602/86 (Interox) 7 August 1986 (07.08.86) page 2 line 25 to page 3 line 19, examples, claims	1 to 12, 14 to 17, 24 to 26
Y	whole document	1 to 30
X	AU,A, 38737/89 (Globus) 10 July 1990 (10.07.90) page 3 line 25 to page 4 line 13, examples, claims	1 to 4, 6 to 10, 23, 24 to 26
Y	whole document	1 to 30
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
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Date of the actual completion of the international search 20 October 1995		Date of mailing of the international search report 25 OCTOBER 1995
Name and mailing address of the ISA/AU AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No.: (06) 285 3929		Authorized officer <i>Ian Robinson</i> Ian Robinson Telephone No.: (06) 283 2283

PCT/INTERNATIONAL SEARCH REPORT

International Application No.

PCT/AU 95/00423

C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	AU,A, 68706/91 (Previsan S.A.) 26 June 1991 (26.06.91) abstract, examples, claims	1 to 4, 6 to 10, 24 to 27, 29
Y	whole document	1 to 30
X	AU,A, 72109/91 (Unilever) 3 September 1991 (03.09.91) examples, claims	1 to 15, 17, 24 to 26
Y	whole document	1 to 30
X	AU,A, 89394/91 (Arnold) 26 May 1992 (26.05.92) page 15 lines 3 to 14, page 20 lines 3 to 19, examples	1 to 10, 14 to 16, 24, 27, 30
Y	whole document	1 to 30
X	US,A, 4699623 (Dubreux) 13 October 1987 (13.10.87) whole document	1 to 22, 24 to 26, 29
Y	whole document	1 to 30
X	US,A, 3574516 (Darmstadt) 13 April 1971 (13.04.71) whole document	1 to 10, 14 to 16, 24, 29
Y	whole document	1 to 30
X	US,A, 3740187 (Kowalski) 19 June 1973 (19.06.73) column 2, lines 48 to 67, examples, claims	1 to 24
Y	whole document	1 to 30
P,X	EP,A, 623283 (Kemira kemi Aktiebolag) 9 November 1994 (09.11.94) whole document	1 to 26, 28
P,Y	whole document	1 to 30
P,X	WO,A, 95/08917 (Sprugel) 6 April 1995 (06.04.95) page 3 line 10 to page 6 line 13, examples	1 to 10, 14, 15, 24 to 26
P,Y	whole document	1 to 30
X	AU,B, 54353/73 (474323) (Colgate) 17 October 1974 (17.10.74) page 7 line 3 to page 9 line 13, examples, claims	1 to 12, 14 to 17, 24 to 26
Y	whole document	1 to 30
X	AU,B, 37804/72 (465680) (A B Heilos) 12 July 1973 (12.07.73) page 7 line 4 to page 12 line 5, examples, claims	1 to 11, 14 to 16, 24 to 26
Y	whole document	1 to 30

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C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	AU,A, 46343/68 (Reckitt) 21 May 1970 (21.05.70) claims, examples	1 to 10, 14 to 16, 24 to 26
Y	whole document	1 to 30
X	Derwent Abstract Accession No. 91-146324/20 class D13, KR,B, 90/03010 (YUN) 4 May 1990 (04.05.90) abstract	1 to 22, 24
Y	abstract	1 to 30
X	Derwent Abstract Accession No. 94-207329/25 classes B04, C03, SU,A, 1808323 (Nonblack Soil Reg Veterinary Res Inst) 15 April 1994 (15.04.94) abstract	1 to 22, 24, 27, 29
Y	abstract	1 to 30
X	Derwent Abstract Accession No. 74404B/41, class D15, JP,A, 54-112557 (Ebara Infilco kk) 3 September 1979 (03.09.79) abstract	1 to 22, 24, 28
Y	abstract	1 to 30
X	Derwent Abstract Accession No. 93-187425/23 class Q49, SU,A, 1740628 (Volga Urals Hydrocarbon Raw Mat) 15 June 1992 (15.06.92) abstract	1 to 22, 24, 26
Y	abstract	1 to 30
X	Derwent Abstract Accession No. 88-017994/03 classes D25, E16, JP,A, 62-280298 (KAO Corp) 12 May 1987 (12.05.87) abstract	1 to 22, 24 to 26
Y	abstract	1 to 30
X	Derwent Abstract Accession No. 91-301051/41 class P34, JP,A, 03-202193 (Kido) 3 September 1991 (03.09.91) abstract	1 to 22, 24 to 26, 28
Y	abstract	1 to 30
X	Derwent Abstract Accession No. 90-020354/03 classes A97, D25, E37, JP,A, 01-301798 (LION) 5 December 1989 (05.12.89) abstract	1 to 22, 24 to 26
Y	abstract	1 to 30
X	Derwent Abstract Accession No. 84-013824/03 class D15, JP,A, 58-205599 (Nippon Caloxide kk) 30 November 1983 (30.11.83) abstract	1 to 22, 24, 28
Y	abstract	1 to 30

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.
PCT/AU 95/00423

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
AU	84/32738	US	5119760	BE	900499	CA	1230281
		JP	60079099	NZ	209450	US	4654341
		WO	9410084	CA	2145878	EP	665814
		AU	32723/93	CA	2145879	EP	616723
		EP	665981	WO	9007390	US	5423285
		WO	9312538	WO	9410702	WO	9410704
		US	5434102	US	5439845	AU	20139/92
		US	5138520	WO	9215112	US	5316579
		AU	48469/90				
AU	52602/86	US	4631141	ZA	8600495	BR	8600348
		CA	1252257	JP	7023480	EP	196738
		ES	551398	ES	8702486	GB	8502374
AU	38737/89	US	5128342	US	4954316	FR	2640850
		WO	9006679				
AU	68707/91	JP	5223425	JP	5276517	EP	656355
		WO	9404516	EP	504184	WO	9107876
AU	72109/91	BR	9105999	CA	2073445	EP	514422
		JP	7068542	WO	9112307		

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International Application No.
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Patent Document Cited in Search Report				Patent Family Member			
AU	72109/91	WO	9112307	GB	8813689	EP	385522
		AU	59541/90	AU	61779/90	AU	71873/91
		AU	71874/91	BR	9007519	BR	9007641
		BR	9106000	BR	9106001	CA	2062781
		CA	2064900	CA	2073432	CA	2073563
		TR	23293	ZA	8805530	EP	491723
		EP	514434	NO	883388	KR	9200111
		GB	8718216	JP	1103700	EP	301882
		CA	1323280	TR	25827	WO	9100902
		WO	9104314	WO	9112308	WO	9112309
		ZA	9100955	ZA	9100956	ZA	9100957
		BR	8803786	EP	484363	AU	50104/90
		BR	9000882	CA	2010442	GB	8908412
		JP	2269800	TR	24976	US	5160655
		ZA	9001406	GB	8920716	IN	171757
		IN	171770	ZA	9006799	GB	8916094
		ZA	9005510	AU	20076/88		
AU	89394/91	WO	9207550	CA	2029820		

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International Application No.
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Patent Document Cited in Search Report				Patent Family Member			
US	4699623	BE	903680	CA	1260209	CH	667282
		DE	3540933	ES	549080	ES	8701876
		FR	2573452	IT	8567975	IT	1182692
		JP	61132674	NL	8503195	US	5122157
		BE	904725	CA	1280853	CH	667670
		DE	3615464	ES	554652	ES	8705062
		FR	2596432	IT	8667427	IT	1215173
		JP	62231071	NL	8601319		
US	3740187	DE	2226784	ES	403436	GB	1354989
		IT	956067	US	3740187	US	3795625
		FR	2140213	US	3766078		
EP	623283	FI	941938	NO	941527	SE	9301389
WO	9508917	DE	4333385	EP	670674	FI	952602
		NO	952114				
AU	54353/73	BE	799432	BR	7203442	CA	998534
		CH	998534	DE	2321949	FR	2184661
		GB	1345119	IT	984911	NL	7306585
		ZA	7302429				
AU	37804/72	AT	10435/71	BE	777595	CA	961729
		CH	589714	DE	2201022	ES	398524
		FR	2121697	GB	1378934	IT	946584
		NL	7200600	US	4252663		

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